



# **PDMP Education Initiative Evaluation Final Report**

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# Table of Contents

Executive Summary.....	3
PDMP Education Initiative Evaluation Final Report.....	6
Background .....	6
Evaluation Methods .....	9
Questionnaire Format.....	9
Outcome Measures.....	11
Data Analysis.....	11
Evaluation Results.....	11
Timeline of Trainings.....	11
Trainings by County.....	15
Module 1 .....	17
Module 2 .....	18
Module 3 .....	20
Module 4 .....	23
Module 5 .....	25
Module 6 .....	27
Module 7 .....	29
Comparing change scores as a function of delivery mode .....	32
Conclusions .....	32
Recommendations .....	33
Appendix .....	35

# Executive Summary

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## Background

Prescription Drug Monitoring Programs (PDMPs) are centralized electronic registries that track the prescribing and dispensation of controlled substances (CS). These are designed to reduce the overprescribing of CSs and to prevent CS misuse and diversion. Licensed prescribers and dispensers and their delegates use the PDMP to conduct searches of patients' CS dispensation histories to help inform current prescribing and dispensing of CSs. The Pa. PDMP system user-base increased every month since its launch in August 2016 and the system now has over 107,000 users.

Since the PDMP system launch, users have requested assistance on a number of topics including how to integrate the use of the PDMP system into clinical workflows, understanding how to identify patient red flags, and how to connect patients with substance use disorder (SUD) treatment. To better assist registered providers and further boost PDMP registration and utilization, Pa. Department of Health (DOH) along with the Department of Drug and Alcohol Programs (DDAP) and the University of Pittsburgh Medical Center (UPMC) have developed educational tools and materials designed to educate prescribers about the system and its utility as well as on other topics related to opioid use, prescribing, and patient care. The educational materials are comprised of seven modules:

*Module 1 – Why Using the PDMP is Important for Achieving Optimal Health for Pennsylvania Citizens*

*Module 2 – How to Use the PDMP to Make Clinical Decisions*

*Module 3 – Using the PDMP to Optimize Pain Management*

*Module 4 – Opioid Prescribing Guide*

*Module 5 – Referral to Treatment for Substance Use Disorder Related to Opioid Use*

*Module 6 – Approaches to Addressing Substance Use Disorder with Patients Identified by the PDMP*

*Module 7 – Effective Opioid Tapering Practices*

Trainings on the aforementioned modules were available in two formats, online and in-person. Online trainings were hosted on the TRAIN PA<sup>1</sup> website and were available to a wide audience. For in-person trainings, Pa. DOH partnered with Quality Insights (QI) and Institute for Research, Education and Training in Addictions (IRETA) as well as with individual universities to provide on-site education on these topics to practices and health systems. The University of Pittsburgh School of Medicine designated each module for a maximum of 1.0 AMA PRA Category 1 Credit™ also called Continuing Medical Education (CME) credits. For in-person trainings, CMEs were awarded for attendance (operationalized as completing both the pre- and post-module questionnaires). For online trainings, CMEs were awarded to trainees who completed the required pre-module questionnaire and passed<sup>2</sup> the scored knowledge section of the post-module questionnaire.

## Evaluation

To evaluate the immediate impact of each training, the evaluation team, Public Health Management Corporation's (PHMC) Research & Evaluation Group, designed pre- and post-module questionnaires for each module, which were completed by online and in-person trainees. All questionnaires followed the

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<sup>1</sup> TRAIN PA website: <https://www.train.org/pa/welcome>

<sup>2</sup> Passing is defined as scoring 80% or higher. Hence, if the knowledge section of the questionnaire has five multiple-choice items, in order to receive a CME credit, the trainee at a minimum will have to answer four of the five items correctly.

same format and were divided into five sections: (1) trainee and training information, (2) knowledge quiz, (3) trainee attitudes about the topic/module, (4) trainee self-reported prior and intended behavior related to module content, and 5) content clarity and trainer knowledge of module content.

At the end of each in-person module, trainers completed a self-reflection/evaluation questionnaire to provide feedback on the session they delivered. This questionnaire was divided into four sections: (1) training logistics, (2) unique topics covered in each module, (3) delivery process and self-assessed delivery quality, and (4) open-ended questions, the first of which focused on challenges faced by trainers during the training.

## Conclusions

For the majority of modules, both in-person and online trainings were effective in increasing knowledge and attitudes related to the module content. Overall, in-person trainings were generally an hour in duration across the various modules, and the variability in training duration was much lower for in-person trainings relative to online trainings. For the four modules (2, 3, 6, & 7) that were available both online and in-person formats, at least 24% of the participants who took these modules online spent 30 minutes or less on the training. Specifically, for modules 2 and 7, the same number was more than 33% of all participants. In comparison, more than 90% of all in-person trainings for modules 2, 3, 6, and 7 were at least 60 minutes or longer.

Module 1's (PDMP's Importance for Achieving Optimal Health) online training did not have a positive impact on knowledge scores following the training. This module presented information about the epidemiology of the opioid epidemic, presenting highly specific information (e.g., prevalence rates and other statistics) in the absence of more global messaging and interpretation of the implications of the statistics presented within the module. For this reason, Module 1's content may have been unlikely to change true knowledge levels. To the extent that trainees processed the materials presented, trainees may have been more likely to change their impressions about the causes of the opioid crisis and contributions of prescribers than they were to retain specific statistics. In fact, attitudes and behavioral intentions did improve following exposure to the module.

All other effects of the modules were in the expected direction. That is, both in-person and online Modules 2 (How to Use the PDMP to Make Clinical Decisions), 3 (Using the PDMP to Optimize Pain Management), 6 (Addressing SUD with PDMP-identified Patients), and 7 (Effective Opioid Tapering Practices), and online Modules 4 (Opioid Prescribing Guide) and 5 (Referral to Treatment for SUD Related to Opioid Use) had positive impacts on trainees' knowledge, attitudes, and reported behavioral intentions. Modules 4 and 5 had only recently begun to be implemented in person, so the number of in-person trainees was relatively low, resulting in insufficient power to detect small to moderate effect sizes. For this reason, we cannot draw conclusions about whether the module impacted attitudes or behaviors. However, these modules did result in a statistically significant increase in knowledge as the magnitude of the effect was larger for this outcome.

At least two-thirds of trainees received a perfect score of 1 (i.e., 100% of items correct) on the pre-module questionnaire knowledge section for Modules 3, 6, and 7, which leaves (1) no possibility for these trainees to demonstrate knowledge gains as a result of the module content, and (2) few trainees in the overall sample to demonstrate knowledge gains following exposure to the module content. This may have limited our ability to evaluate the impact of these modules on knowledge scores. However, because trainees on the whole demonstrated improvement from pre- to post-module for both in-person and online trainings for all of these modules, at least some items in the questionnaires are accurately measuring knowledge gain.

## Recommendations

Based on these findings, we have developed a number of recommendations that are summarized below.

**CME process.** Pa. DOH should reevaluate the CME process used to incentivize participation in the initiative. For online trainings, trainees earned one CME credit for each module that they completed and achieved a knowledge score of 80% or greater. Because they could continue to retake the post-module questionnaire until they reached this threshold, it is possible that some trainees may not have thoroughly reviewed the module content. In addition, this structure (i.e., one CME credit for completion of each module) may not encourage online participants to complete the entire module series, which may decrease the reach of the trainings. Future initiatives could consider offering the trainings as a “bundle” of modules or decreasing the CME unit value for the completion of each module. Half (0.5) of a CME is more concordant with the amount of time trainees invested in each online training module.

**Long-term impact.** The opioid education curriculum was effective in changing knowledge, attitudes, and behaviors/intentions related to module topics as measured by pre- and immediate post-module questionnaires. The current evaluation did not evaluate the sustained impact of the intervention over time on knowledge, attitude, and self-reported behavior (i.e., retention and integration of information presented in the modules over time). In addition, the current evaluation did not examine objectively measured changes in the trainee’s behavior related to PDMP use (e.g., changes in the frequency of PDMP searches, changes in prescribing behaviors). We recommend building and prioritizing the further evaluation of the education modules to determine their long-term impact.

**Delivery mode.** There were no differences in the direction of the effects for the outcomes examined within each module across the two delivery modes for Modules 2, 3, 6, and 7, which were delivered both in-person and online to a large number of trainees. The differences in impact between in-person and online delivery may be more subtle. For example, long-term retention of information and impact on skills and application of information such as actual prescribing behavior or conversations with patients were not measured by this evaluation. It is likely that a substantial proportion of individuals who received the online training did not engage in systematic processing of the material given the short amount of time in which they completed the training. This trend was most clearly reflected in modules 1, 4, and 5, where almost one-third of all training participants spent five minutes or less on browsing the training materials. For the remaining modules, at least 11% of participants spent 15 minutes or less on the training content. Pa. DOH should define education priorities in terms of length of training, accessibility, and short- and long-term impacts before allocating resources to in-person and/or online training delivery. Further research experimentally examining the impact delivery mode (e.g., randomizing individuals to receive the training in either the in-person or online delivery) and conducting a cost-benefit analysis would allow the PDMP Office to make a more fully informed decision about optimal delivery mode for this initiative. The decision should also consider issues related to reach and accessibility of the different modalities.

**Module modification.** Findings suggest that the content and/or questionnaires for Modules 1, 3, 6, and 7 may require modification. For example, Module 1 could be improved by providing supporting materials to help trainees process specific statistics and facts to impact general knowledge; a knowledge questionnaire could then focus on more general knowledge rather than recall of specific statistics. We recommend more in-depth evaluation of these modules through qualitative interviews and cognitive testing with a sample of providers. If Modules 3, 6, and 7 present more basic information related to each topic (based on high pre-module knowledge scores), additional modules could be designed to present more advanced and in-depth information on these topics.

# PDMP Education Initiative Evaluation Final Report

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## Background

Prescription Drug Monitoring Programs (PDMPs) are centralized electronic registries that track the prescribing and dispensation of controlled substances (CS). These are designed to reduce the overprescribing of CSs and to prevent CS misuse and diversion. Licensed prescribers and dispensers use the PDMP to conduct searches of patients' CS dispensation histories to help inform current prescribing and dispensing of CSs. Prescribers and dispensers can also register delegates to perform patient searches on their behalf. The Pa. PDMP system launched in August 2016, and since then, it has been a point-of-care decision tool for prescribers and pharmacists. The Pa. PDMP system user-base increased every month since its launch and the system now has over 107,000 users who conduct nearly 1.7 million patient searches per month on average.

Since the PDMP system launch, users have requested assistance on a number of topics including how to integrate the use of the PDMP system into clinical workflows, understanding how to identify patient red flags, and how to connect patients with substance use disorder (SUD) treatment. To better assist registered providers and further boost PDMP registration and utilization, Pa. Department of Health (DOH) along with the Department of Drug and Alcohol Programs (DDAP) and the University of Pittsburgh Medical Center (UPMC) have developed educational tools and materials designed to educate prescribers about the system and its utility as well as on other topics related to opioid use, prescribing, and patient care. The educational materials are comprised of seven modules, and they cover the following content areas:

### *Module 1 – Why Using the PDMP is Important for Achieving Optimal Health for Pennsylvania Citizens*

The introductory module provides trainees with general information about the public health crisis that has resulted from opioid use disorder (OUD) and related overdoses. Both national and Pennsylvania statistics about SUD rates, overdose deaths, comorbidities, and misuse of prescription medications are reviewed with trainees. In addition, the module presents SUD as a chronic disease and provides data comparing SUD to other chronic diseases (e.g. diabetes, hypertension) in terms of medical compliance, other treatment compliance, and relapse. Module 1 also includes the 13 principles for effective SUD treatment developed by the National Institute on Drug Abuse (NIDA), which address the chronic nature of the disease. Next, the module discusses the healthcare and societal costs associated with OUD. The final section of the module outlines the four ways the PDMP can help address the opioid epidemic which include (1) reducing the amount of opioids accessible in the community, (2) identifying persons with an OUD and referring them to treatment, (3) allowing specialty treatment providers to monitor patient abstinence, and (4) reducing overdose deaths and demands for treatment.

### *Module 2 – How to Use the PDMP to Make Clinical Decisions*

The goals of the second module are to explain the Pennsylvania laws regarding the mandated use of the PDMP, explore ways the PDMP can be incorporated into clinical workflows, and discuss how the PDMP can be used to make clinical decisions. With these goals in mind, the module identifies the groups of individuals who are required to register and use the PDMP as well as the types of medications for which dispensation is recorded in the PDMP. Prescribers are provided with techniques to assist with incorporating the PDMP into their clinical workflows. These techniques include delegation, data timeliness and coordinated care, integration of the PDMP into Electronic

Health Record (EHR) and Pharmacy systems, data summaries, and bulk searches. Lastly, the module outlines how to use query results from the PDMP to facilitate clinical decision making by identifying prescribing patterns that can put a patient at risk and alerting prescribers to potential drug diversion and misuse. The education content is supplemented with fact sheets on (1) aberrant dispensing and prescribing and (2) prescriber and dispenser information regarding who should register and additional resources.

### *Module 3 – Using the PDMP to Optimize Pain Management*

Module 3 teaches prescribers and pharmacists/dispensers how to utilize the PDMP to address pain management in different patient populations. The nature of pain and how to address it is reviewed for patients suffering from back pain, osteoarthritis, headache/migraine, and fibromyalgia. In addition, the training provides information on chronic pain diagnoses for high-risk groups of patients such as pediatric, elderly, and pregnant patients. Other groups requiring special considerations include persons with mental health conditions and SUD patients. Regardless of the patient population, the module encourages prescribers and pharmacists/dispensers to conduct urine drug testing and to use queries from the PDMP to develop a medication history and support patient safety by identifying potential misuse and dangerous drug combinations. The training includes a table of alternative non-opioid pain management strategies for each population discussed. Supplemental materials include a flow diagram of nonpharmacological, non-opioid pharmacological, and opioid therapies for pain management as well as a pocket card that prescribers can use to remind them of ways to utilize the PDMP when treating patients with chronic pain.

### *Module 4 – Opioid Prescribing Guide*

This module provides prescribers with guidelines on how to safely and accurately prescribe opioids in both the acute and chronic phases of pain. Prescribers also learn how to assess risks and reduce the harms of opioid use, specifically when treating chronic pain patients. The training explains the legal responsibilities for providers prescribing opioids in emergency departments, urgent care centers, to patients under observation in the hospital, and minors. Other legal responsibilities such as the patient's voluntary non-opioid directive form and the opioid overdose reversal act are also described. The final section of the training instructs prescribers to inform their patients on how to properly dispose of opioids and other medications. Supplemental materials include a prescribing checklist, prescribing fact sheet, prescribing pocket card and a Pennsylvania laws fact sheet and pocket card.

### *Module 5 – Referral to Treatment for Substance Use Disorder Related to Opioid Use*

The primary goals of Module 5 are to teach prescribers and pharmacists/dispensers how to identify patients who are in need of SUD treatment and introduce prescribers to “warm handoffs” in which providers use patient-centered communication strategies to refer to and motivate patients to engage in SUD treatment. Varying levels of additional contact or support are available to the patient. The module provides guidance on validated screening tools and “warm handoff” protocols for both primary care and emergency medicine settings. Other sections of this module include (1) assessing the patient's level of care and what each level of care includes, (2) Federal and State level SUD patient confidentiality considerations when reviewing PDMP reports and conducting “warm handoffs”, and (3) links healthcare providers can use to refer patients to treatment.

### *Module 6 – Approaches to Addressing Substance Use Disorder with Patients Identified by the PDMP*

This module teaches prescribers how to utilize PDMP data and other screening tools to identify individuals in need of SUD treatment through the Screening, Brief Intervention, and Referral to



Treatment (SBIRT) process. The module provides the definition of SBIRT as well as instructions on how to conduct the specific components of SBIRT. In addition, prescribers receive information on how to proceed when they encounter treatment-resistant patients and steps to take to establish SBIRT in their practice. The module provides several supplemental materials including videos, an SBIRT primer, a Motivational Interviewing primer, an SBIRT pocket card, SBIRT frequently asked questions, and an online directory of SBIRT trainers and toolkits.

### *Module 7 – Effective Tapering Practices*

Module 7 teaches prescribers how to effectively and safely taper patients from opioid therapy. The training reviews ways that the prescriber can use the PDMP and other indicators, such as lack of effectiveness of therapy, to determine if tapering is appropriate. In addition, the module provides patient-centered techniques, such as motivational interviewing, for discussing tapering with the patient. Prescribers receive a general tapering protocol that describes procedures to (1) educate and assess the patient for related risks before tapering, (2) calculate and determine the rate and speed of the taper, (3) follow up and reassess the patient while tapering, and (4) achieve the goal of a lower dose or discontinuation. Finally, the training discusses the symptoms of withdrawal and ways to measure and manage their patients' symptoms. Supplemental materials include an opioid tapering flow chart and pocket card.

The University of Pittsburgh School of Medicine designated each module for a maximum of 1.0 AMA PRA Category 1 Credit™ also called Continuing Medical Education (CME) credits. Trainings on the aforementioned modules were available in two formats: online and in-person. Online trainings were hosted on the TRAIN PA<sup>3</sup> website and were available to a wide audience in the state including providers, as well as students, administrative staff etc. TRAIN is a learning network that provides quality training opportunities for professionals who protect and improve the public's health. Individuals interested in receiving online training first registered on TRAIN's Pa. affiliate website. Once registered, they were able to access trainings for all education modules. There were no pre-requisites and the modules did not need to be completed in any specific order. Individuals could start with any module, and they could complete a minimum of one and a maximum of seven modules.

For in-person trainings, Pa. DOH partnered with Quality Insights (QI), Institute for Research, Education and Training in Addictions (IRETA) and multiple universities including the University of Pennsylvania, University of Pittsburgh to provide on-site education on these topics to practices, health systems and university students. Trained instructors and university professors from the organizations were tasked to deliver trainings across the state. Multiple instructors from each organization were involved in this education delivery. A single instructor per training was the norm; however, in some cases two or more instructors took part in delivering a particular training. The latter was usually due to the size of the class, where large number of trainees prompted two or more trainers to share the responsibilities of the training. Initially, in-person trainings were only available for Modules 2, 3, 6, and 7. Healthcare organizations (HCOs) and other providers had the option to select individual sessions for any possible combination of these modules. Later around the start of 2019, the PDMP office made in-person trainings available for Modules 4 and 5 as well. No in-person trainings were planned for Module 1.

A total of 27 counties across Pa. were targeted in the first two rounds of this initiative. To engage sites in these counties, both QI and IRETA conducted outreach to over 450 organizations including health care systems, private practices and other stakeholders.

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<sup>3</sup> TRAIN PA website: <https://www.train.org/pa/welcome>



The outreach was a four-tier process. The first step was determining eligible HCOs/Practices/Stakeholder locations in targeted counties. This was followed by gathering contact information of relevant stakeholders by utilizing existing provider contacts, lists provided by the PDMP Office and other independent searches. With all this essential information at hand, the teams then started making formal contact with sites via email or phone. After making contact, the teams began their engagement with the site staff and usually, it took several follow-up emails and calls to schedule and confirm the trainings at a site. Since March 2018, more than two-hundred in-person trainings have been completed at over a hundred locations across 21 counties in Pa.

## Evaluation Methods

### Questionnaire Format

#### Pre- & Post-Questionnaires

To evaluate the immediate impact of each training, the evaluation team, Public Health Management Corporation's (PHMC) Research & Evaluation Group, designed pre- and post-module questionnaires for each module. All questionnaires followed the same format and were divided into five sections. Descriptions of each of the five sections are described below:

***Section 1—Trainee and training information:*** The first section of the questionnaire was identical across all cross modules. It collected identifying information about the trainee (i.e., collected first and last names, roles, employment status, employment setting, national provider identifier (NPI), state license number, work and home zip codes) and the training (i.e., training collected date, location).

***Section 2—Knowledge quiz:*** This second section of the questionnaire was tailored to the content of the specific module and designed to measure knowledge of the content covered in the module. Questions used a multiple choice format and the number of knowledge questions ranged from 5 to 8 across the seven modules.

***Section 3—Trainee attitudes about the topic/module:*** The third section gathered information about trainees' attitudes related to the overall themes of the specific modules. For each module, this section included three items for which trainees were asked to share their level of agreement with each statement using a five-point Likert scale (1 = strongly disagree; 2 = disagree; 3 = neither; 4 = agree; 5 = strongly agree).

***Section 4—Trainee self-reported prior and intended behavior related to module content:*** Items in this section were specific to each module and were designed to evaluate changes in behavioral intentions related to the topic of each module. The pre-module items focused on trainees' behavior to-date in relation to the topics covered in the module, whereas in the post-module questionnaire the same items focused on behavioral intentions for the next 30 days (e.g., I currently vs. I plan to). Module 6 contained two unique behavioral items and the remaining modules contained three unique behavioral items. Trainees rated their level of agreement with each statement using the five-point Likert scale described for Section 3 above.

***Section 5—Content clarity and trainer knowledge of module content:*** The last section was identical across all modules. Comprised of two items, the section asked trainees to rate the clarity of the content presented and the knowledge of trainers about the content they were delivering. Trainees rated their level of agreement with each statement using the five-point Likert scale described for Section 3 above. For questionnaires evaluating online modules, only the item on clarity of content was included.

## Trainer Self-Reflection Questionnaire

At the end of each in-person module, trainers completed a self-reflection/evaluation questionnaire to provide feedback on the session they delivered. This questionnaire was also structured by sections. The first section recorded information about the training (e.g., date, start/end times, location).

The second section focused on the training and, therefore, was comprised of unique items tailored to the module's content. Each item in this section referred to a particular topic within a given module and trainers were asked whether they covered these topics "completely" or "partially" or "not covered". Trainers were oriented toward the survey prior to using this topic checklist to ensure valid reporting; the orientation emphasized that the checklist was designed to capture the degree of intentional tailoring that the trainers did for their audiences, as well as an unplanned variation in topic coverage, for example, due to time constraints.

The third section was the same across all modules, and it broadly focused on the delivery process and self-assessed delivery quality. The section was further divided into two sub-sections, each comprised of three items. Sub-section one focused on whether the trainer was able to meet the individual needs of the trainees and health care entity. The items in this sub-section were measured on a six-point time-based Likert scale (1 = all of the time, no; 2 = most of the time, no; 3 = some of the time, no; 4 = some of the time, yes; 5 = most of the time, yes; 6 = all of the time, yes). The items in sub-section two focused on the level of trainee engagement during the training. Trainers were asked to provide feedback on whether trainees asked questions, shared their comments, and developed a good rapport with the trainer. The items in this sub-section were measured on a six-point Likert scale of agreement ranging from 1 = strongly disagree; 2 = disagree; 3 = somewhat disagree; 4 = somewhat agree; 5 = agree; to 6 = strongly agree.

The fourth and final section was comprised of three open-ended questions, the first of which focused on challenges faced by trainers during the training. The second question asked for feedback about any training materials that were not included but would be helpful to have in future trainings. The last question recorded suggestions for the trainer's own supervisor and/or the PDMP office based on the trainer's experience from a particular training. This section was not analyzed or included in the results presented in this report, and instead was used for trainers to communicate requests for materials or guidance to DOH.

Trainees received CME credits for completing each type of training. For in-person trainings, CMEs were awarded for attendance (operationalized as completing both the pre- and post-module questionnaires). For online trainings, CMEs were awarded to trainees who completed the required pre-module questionnaire and passed<sup>4</sup> the scored knowledge section of the post-module questionnaire. Trainees had no restrictions on the number of times they could take the post-module questionnaire to achieve a passing score. Credits were given based on the number of modules completed<sup>5</sup>, therefore, a trainee could receive a maximum of one CME credit per each module for a maximum of seven overall.

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<sup>4</sup> Passing is defined as scoring 80% or higher. Hence, if the knowledge section of the questionnaire has five multiple-choice items, in order to receive a CME credit, the trainee at a minimum will have to answer four of the five items correctly.

<sup>5</sup> CMEs cannot be duplicated for a given module by taking it both in person and online.

## Outcome Measures

**Knowledge Score<sup>6</sup>:** This score was derived from the knowledge section of the questionnaires (Section 2). Knowledge scores reflected the proportion of items the trainee answered correctly to the total number of items for the module's knowledge section and could range from 0 (zero correct) to 1 (100% correct). To standardize knowledge evaluation and scoring of in-person and online trainees, scores from the first attempted post-module questionnaire were used in the analysis for online trainees who completed the questionnaire more than one time. Results from subsequent attempts were not used in any score calculations. Knowledge score change was calculated as post-module knowledge score minus pre-module knowledge score; positive change scores indicated improvement after the module exposure.

**Attitude Score<sup>7</sup>:** Items measuring trainee attitudes about topics covered in a given module were measured on a five-point level of agreement scale. Therefore, attitude scores could range from 1 to 5, with higher scores reflecting greater level of agreement with attitudes encouraged by a module, and lower scores indicating disagreement with those attitudes. Pre- and post-module mean attitude scores for each trainee were calculated by using the mean of the trainee's responses of these items.

**Intention Score:** Items measuring trainee current and intended behaviors related to the topics covered in a given module were measured on a five-point Likert scale. Therefore, intention scores could also range from 1 to 5, with higher scores reflecting greater level of agreement that the trainee practices/will practice behaviors encouraged in the module, and lower scores indicating disagreement that the trainee practices/will practice those behaviors. Pre- and post-module intention scores for each trainee were calculated using the mean of the trainee's responses of these items.

## Data Analysis

Descriptive statistics were calculated for variables including timeline, location, time spent, knowledge scores, attitude scores, intention scores, and score change for both online and in-person trainings. For items in which respondents answered questions pre- and post-module, we examined changes in knowledge, attitude, and intention scores using dependent t-tests. All descriptive and inferential data analyses were performed using SPSS.

## Evaluation Results

### Timeline of Trainings

#### Online

Data were collected from online trainings from April 2018 through April 2019. Overall, the greatest number of trainees participated during the fourth quarter of 2018 (n = 4085). However, of all the modules during the entire data collection period, the most trainees participated in Modules 3 (n = 902) and 4 (n = 806) in the first quarter of 2019. The fewest number of trainees participated in the second quarter of 2018 (n = 1156). Overall, 3,536 unique participants completed online trainings between April 2018 and April 2019.

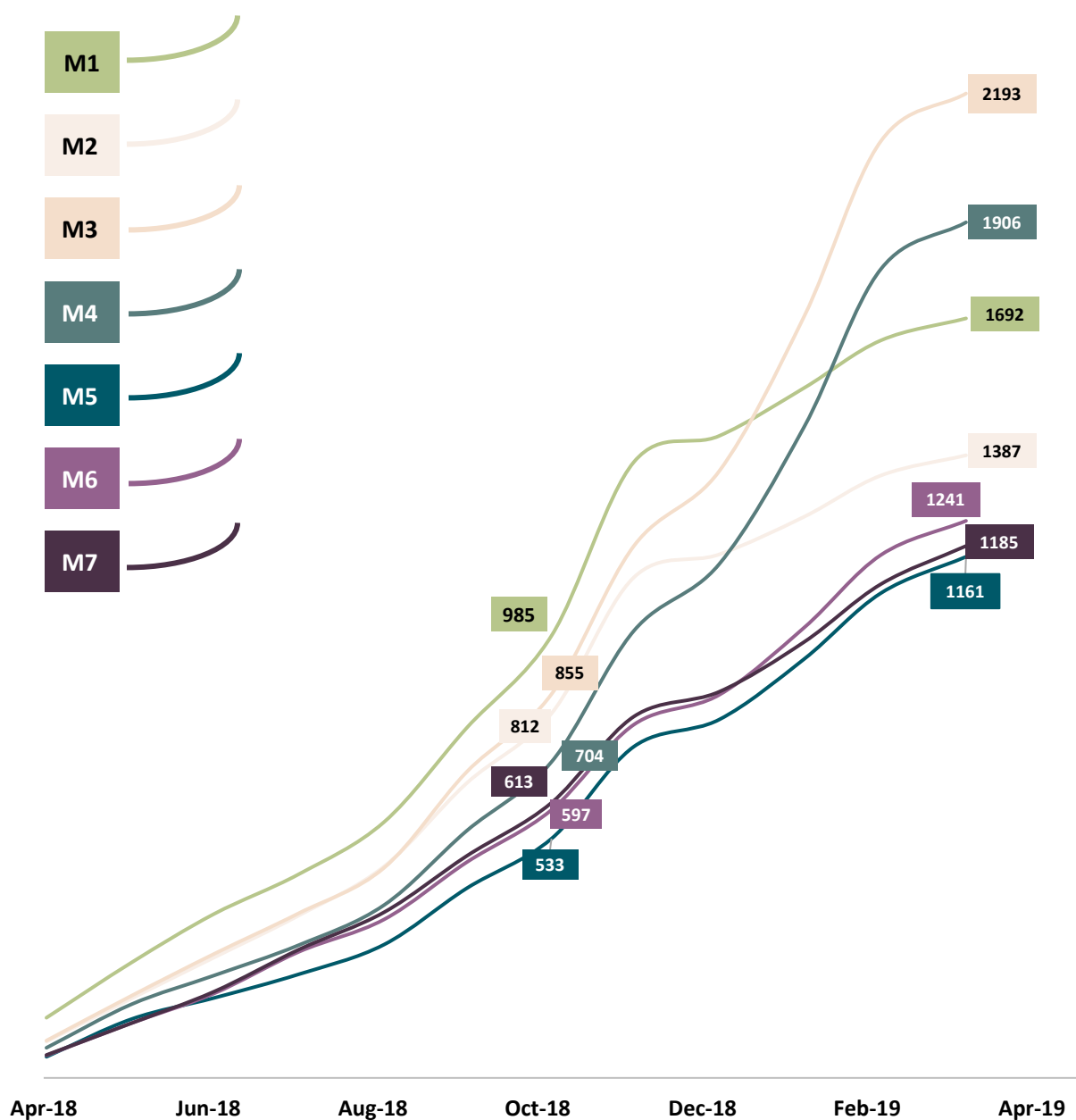
At the midway point in October 2018, the most trainees completed Module 1 (n = 985), and the least trainees completed Module 5 (n = 533). At the final data collection point, the most trainees completed

<sup>6</sup> For knowledge scores, any missing responses were considered as incorrect, and the knowledge score was calculated based on the total number of correct available responses.

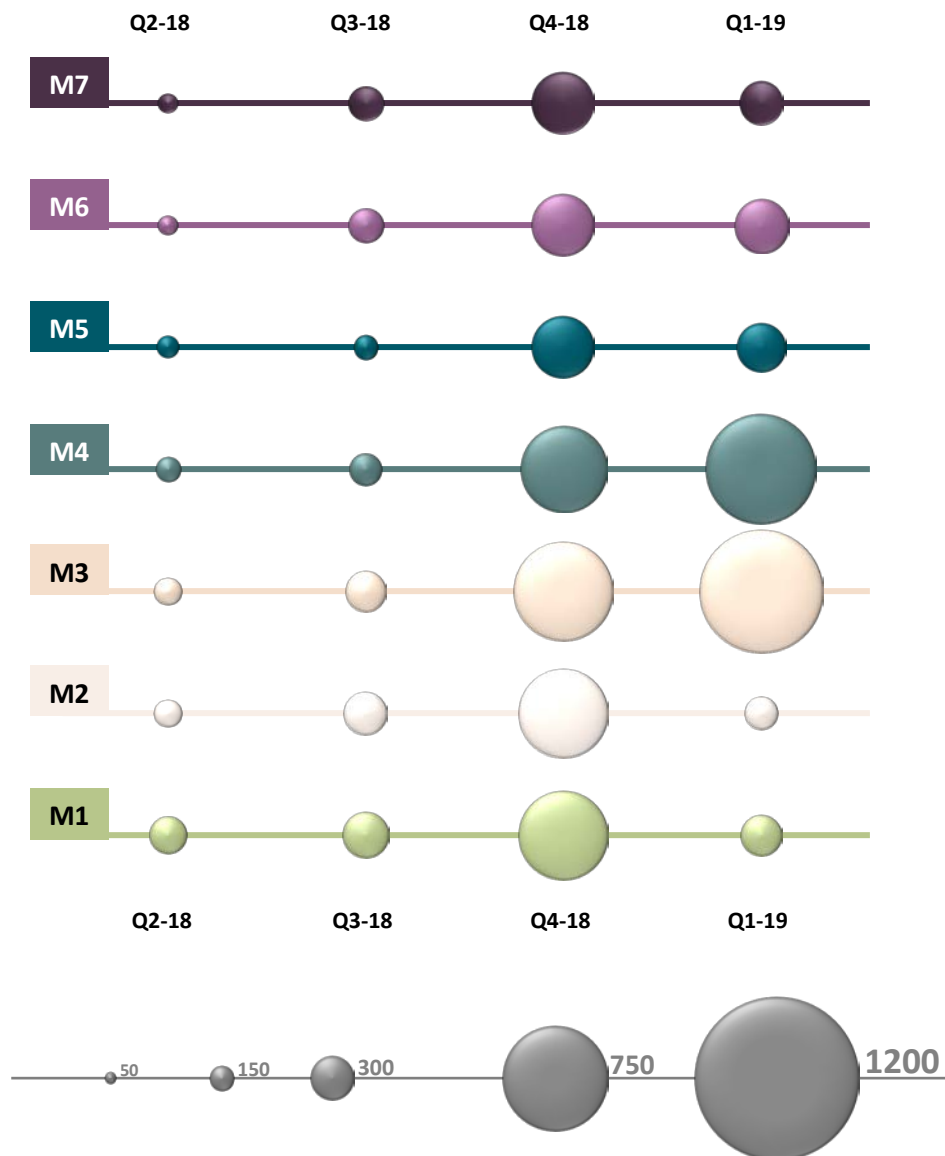
<sup>7</sup> For attitude and intention score, if any item was missing, the mean score was based on the total number of available items. Therefore, if the mean score comprised of three items, and the response for one of the items was missing for an individual, the final mean score was calculated from two items.

Module 3 (n = 2193), and the least trainees completed Module 5 (n = 1161). Overall, 1692 trainees completed Module 1, 1387 trainees completed Module 2, 1906 trainees completed Module 4, 1241 trainees completed Module 6, and 1185 trainees completed Module 7. Results are presented in Figures 1 and 2 below.

**Figure 1. Cumulative online training timeline by month**



**Figure 2. Online training in each quarter**



### In-Person

Data were collected from in-person trainings conducted from April 2018 through April 2019. Overall, the greatest number of trainees participated during the third quarter of 2018 ( $n = 2882$ ). Of all the modules during the entire data collection period, the most trainees participated in Modules 6 ( $n = 812$ ) and 7 ( $n = 742$ ) in the third quarter of 2018. The fewest number of trainees completed the training in the fourth quarter of 2018 ( $n = 109$ ). Modules 4 ( $n = 33$ ) and 5 ( $n = 102$ ) had very low participation throughout the entire data collection period. Overall, 1,830 unique participants completed in-person trainings between March 2018 and April 2019.

At the final data collection point, the most trainees completed Module 6 ( $n = 1215$ ), and least trainees completed Module 4 ( $n = 33$ ). Overall, 1071 trainees completed Module 2, 864 trainees completed Module 3, 102 trainees completed Module 5, and 1093 trainees completed Module 7. Results are presented in Figures 3 and 4 below.

Figure 3. In-person training timeline showing the number of trainees trained by month

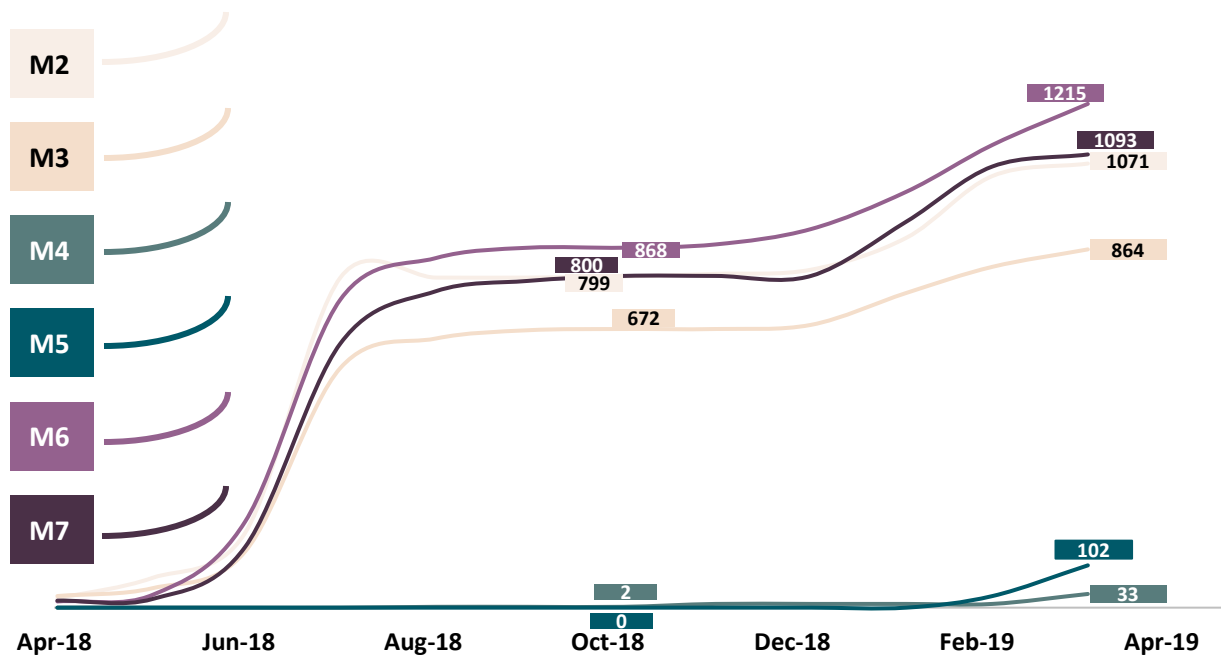
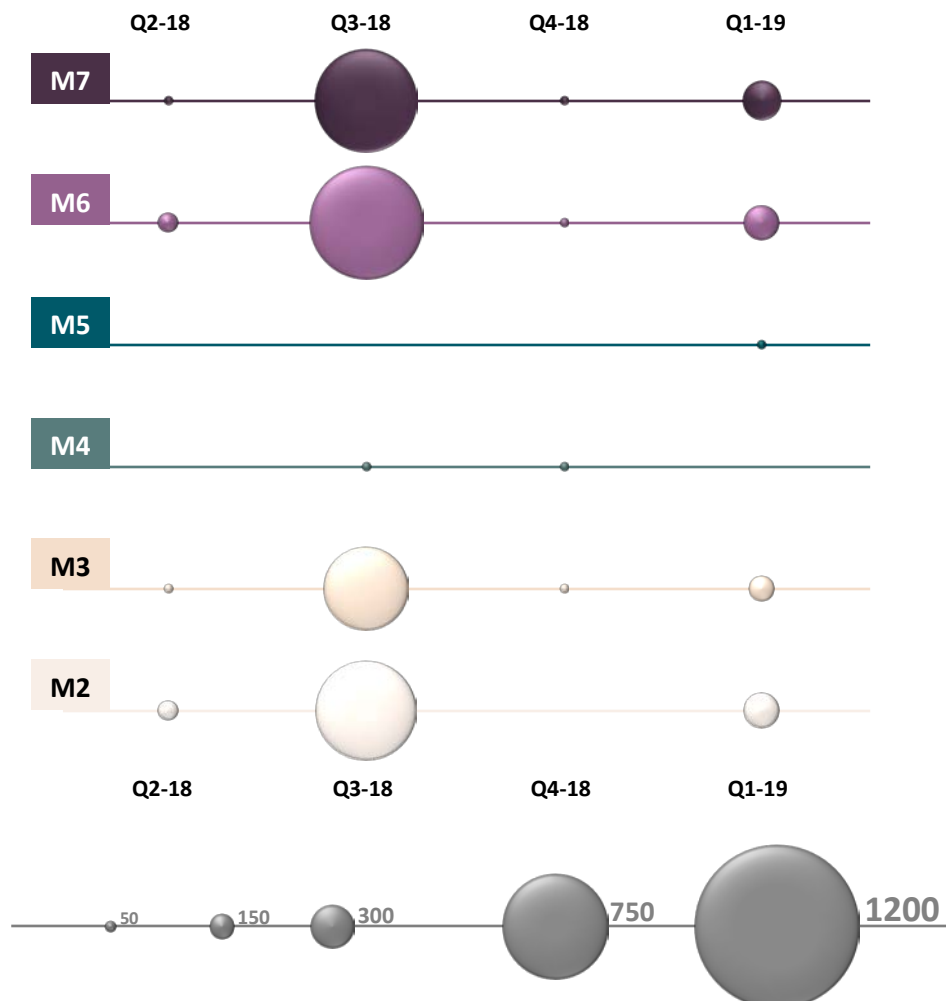


Figure 4. In-person training timeline showing the number of trainees trained by quarter

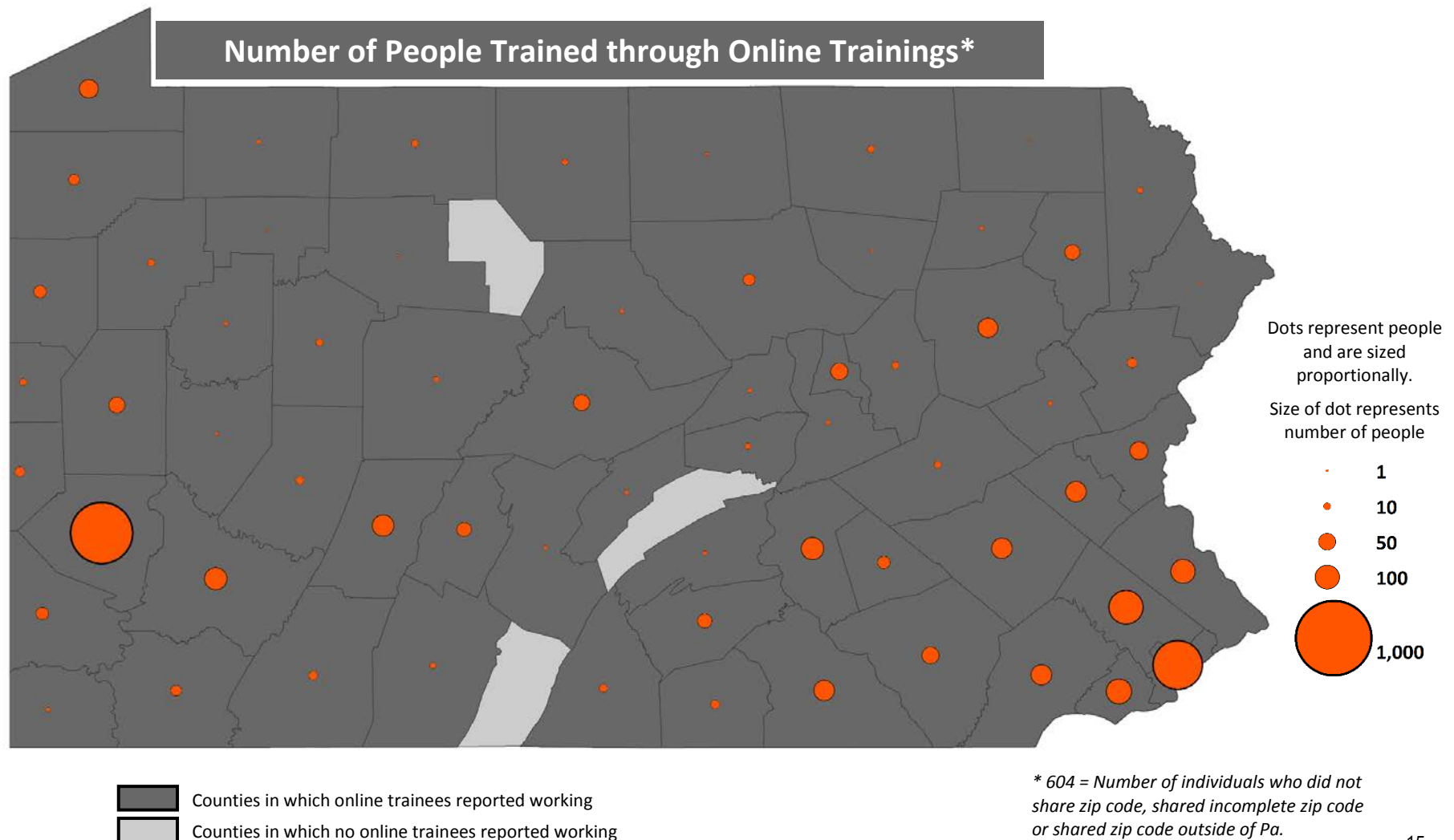


## Trainings by County

### Online

In total, trainees who completed online trainings indicated working in 64 unique counties in Pa. There were three counties in which no trainees reported working. The counties in which the most trainees worked were Allegheny (n = 666) and Philadelphia (n = 423). Trainees tended to work in the Southeastern and Southwestern parts of Pa., with fewer trainees working in Central Pa. There were 604 trainees who did not share their zip code, shared an incomplete zip code, or shared a zip code outside of Pa. Results are presented in Figure 5 below.

**Figure 5. Number of people trained through online trainings**





## In-Person

Overall, trainees who attended in-person trainings indicated working in 52 unique counties in Pa. There were 15 counties in which no trainees reported working. The counties in which the most trainees worked were Allegheny (n = 273) and Philadelphia (n = 246). Trainees tended to work in Southeastern and Western Pa., with fewer trainees working in Central Pa. There were 262 trainees who did not share their zip code, shared an incomplete zip code, or shared a zip code outside of Pa. Results are presented in Figure 6 below.

**Figure 6. Number of people trained through in-person trainings**



## Module 1: Why Using the PDMP is Important for Achieving Optimal Health for Pennsylvania Citizens

### Time spent on training<sup>8</sup>

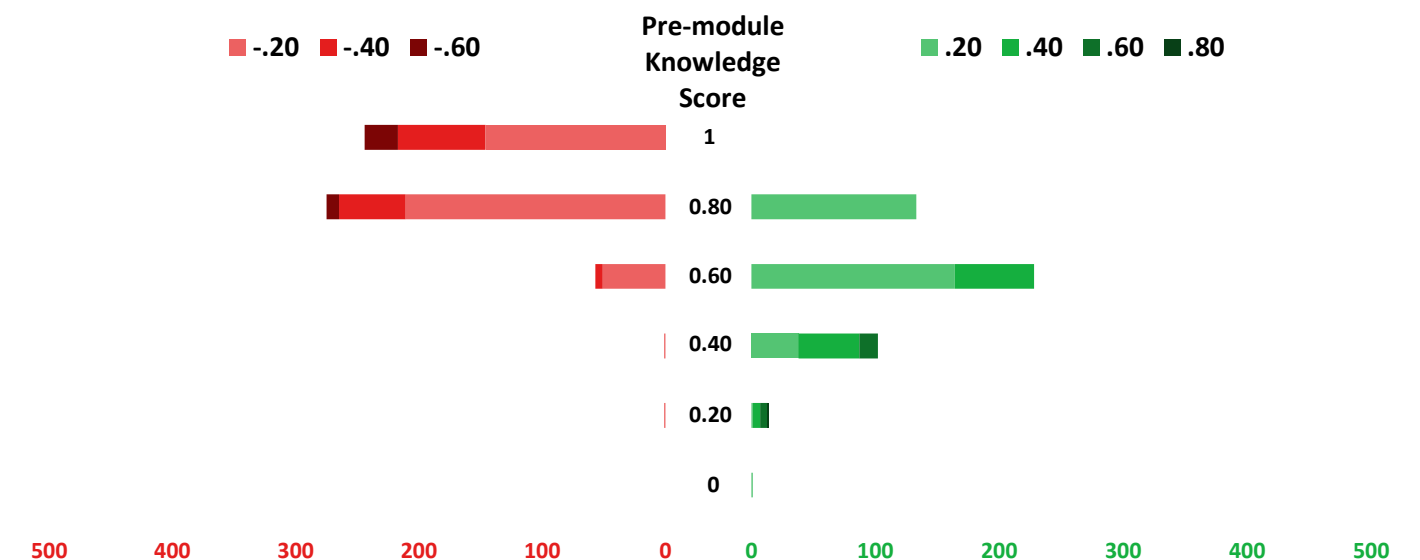
Time spent on training was operationalized as the amount of time that had elapsed between the timestamp on the pre-module questionnaire and the timestamp on the first post-module questionnaire. The majority of trainees (n = 1005, 53.54%) spent 15 minutes or less on the Module 1 training, 14.54% (n = 273) took 15 to 30 minutes, 6.71% (n = 126) took 30 to 60 minutes, and 25.20% (n = 473) took more than one hour. One fifth (n = 381, 20.30%) of the trainees took 150 minutes or more to complete the training. On average, trainees spent 16.91 minutes (n = 1496, SD = 24.39) on the Module 1 online training.

### Outcomes

A total of 1692 trainees completed both the pre- and post-module questionnaires for the Module 1 online training. On average, knowledge scores were higher for the pre-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .76$ ,  $SD = .18$ ) and post-module knowledge scores ( $M = .74$ ,  $SD = .19$ );  $t(1690) = 2.96$ ,  $p < .01$ . A total 1034 (61.11%) trainees passed the post-module questionnaire (i.e. received a score of at least 80%) on their first attempt. Of the 1300 trainees that did not get a perfect score on the pre-module questionnaire, 478 (36.77%) improved their score on the post-module questionnaire. As illustrated in Figure 7 below, 374 trainees passed the pre-module questionnaire, but failed the first post-module questionnaire attempt. However, over 200 trainees who did not pass the pre-module questionnaire were able to achieve a passing score on the post-module questionnaire with improvements ranging from .20 to .80. Sixty-five trainees at least doubled their pre-module questionnaire score.

**Figure 7. Module 1 online training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*635 trainees had no change in their post-module knowledge scores. Of these, 180 trainees had a pre-module knowledge score of less than 0.80.

<sup>8</sup> Trainees who spent more than 150 minutes on the training were excluded from this and all subsequent calculations of time.

Trainees were asked to rate the extent to which they agreed that (1) people who are prescribed opioids often develop OUD, (2) people who are prescribed opioids transition to illicit opioid use, and (3) prescribers play an integral role in preventing individuals from developing OUD. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 3.46$ ,  $SD = .70$ ) and the post-module questionnaire ( $M = 3.86$ ,  $SD = .84$ );  $t(1690) = -19.36$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to use the PDMP to search patients' prescription history in the next 30 days. They were also asked to rate the extent to which they agreed that they would refer a patient to SUD treatment or alternative pain management treatment if evidence from the PDMP indicated they may have an OUD in the next 30 days. Trainees indicated a greater level of agreement with behaviors encouraged in the module after module exposure. Results from the dependent t-test comparing intention scores indicated that this difference was significant in the pre-module questionnaire ( $M = 4.12$ ,  $SD = .82$ ) and the post-module questionnaire ( $M = 4.76$ ,  $SD = .54$ );  $t(1690) = -31.94$ ,  $p < .001$ .

## Module 2: How to Use the PDMP to Make Clinical Decisions

### Online

#### Time spent on training

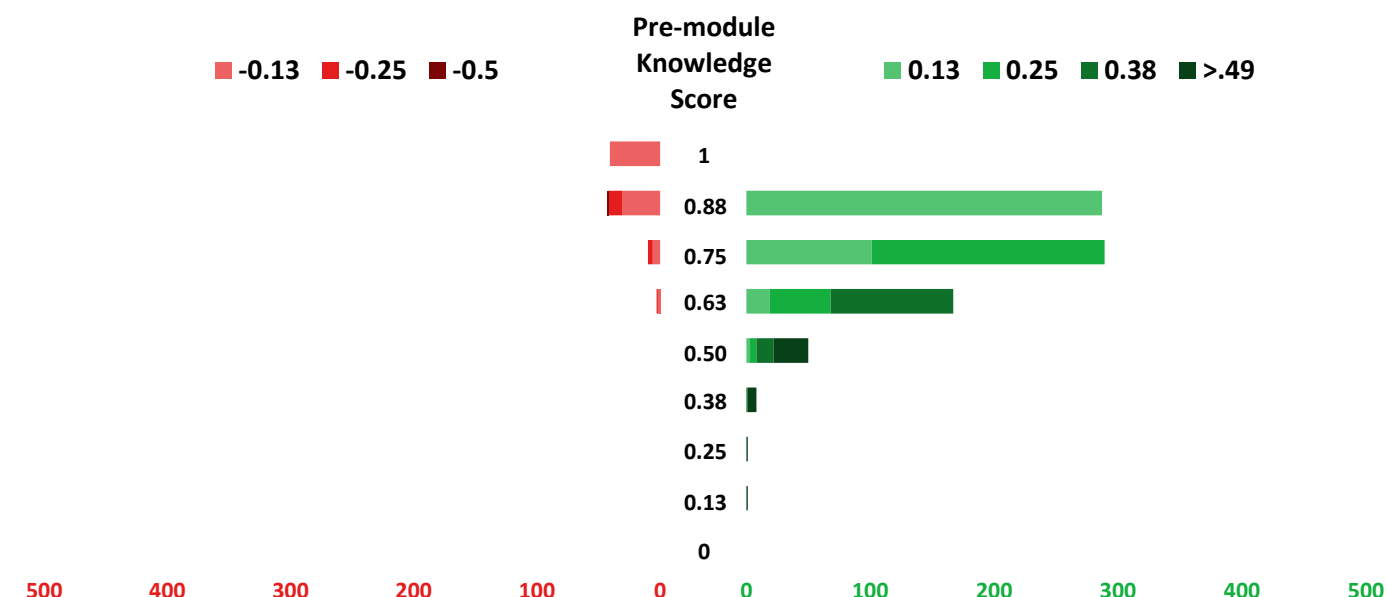
One third of trainees ( $n = 499$ , 33.04%) spent 30 to 60 minutes on the Module 2 online training. Another third ( $n = 478$ , 31.66%) of trainees spent more than 60 minutes completing the training. About one quarter ( $n = 366$ , 24.24%) of the trainees took 15 to 30 minutes to complete the training, and 22.12% ( $n = 334$ ) took over 150 minutes. Only 11.06% ( $n = 167$ ) spent 15 minutes or less on the training. On average, trainees spent 36.55 minutes ( $n = 1176$ ,  $SD = 24.62$ ) on the Module 2 online training.

#### Outcomes

A total of 1387 trainees completed the pre- and post-module questionnaire for the Module 2 online training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .83$ ,  $SD = .15$ ) and post-module knowledge scores ( $M = .94$ ,  $SD = .10$ );  $t(1385) = -28.12$ ,  $p < .001$ . At first attempt, 1249 (90.05%) trainees passed the post-module questionnaire. Of the 1022 trainees who did not get a perfect score on the pre-module questionnaire, 803 (78.57%) improved their score on the post-module questionnaire. This change is visually represented in Figure 8 below. In addition, fewer than 50 trainees who initially passed the pre-module questionnaire received a post-module questionnaire score below .80.

**Figure 8. Module 2 online training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*486 trainees had no change in their post-module knowledge scores. Of these, 54 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked rate the extent to which they agreed that (1) they were aware of all the scenarios that require a PDMP query, (2) PDMP implementation would disrupt workflow, and (3) using a delegate to access the PDMP is a good time-saving strategy. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 3.49$ ,  $SD = .71$ ) and the post-module questionnaire ( $M = 3.77$ ,  $SD = .49$ );  $t(1385) = -15.29$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) use the PDMP to search their patient prescription history, (2) use the PDMP before deciding whether to prescribe/dispense Schedule II-V controlled substances, and (3) use a delegate to access the PDMP on their behalf. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 3.99$ ,  $SD = .95$ ) and the post-module questionnaire ( $M = 4.60$ ,  $SD = .68$ );  $t(1385) = -25.61$ ,  $p < .001$ .

## In-Person

### Time spent on training

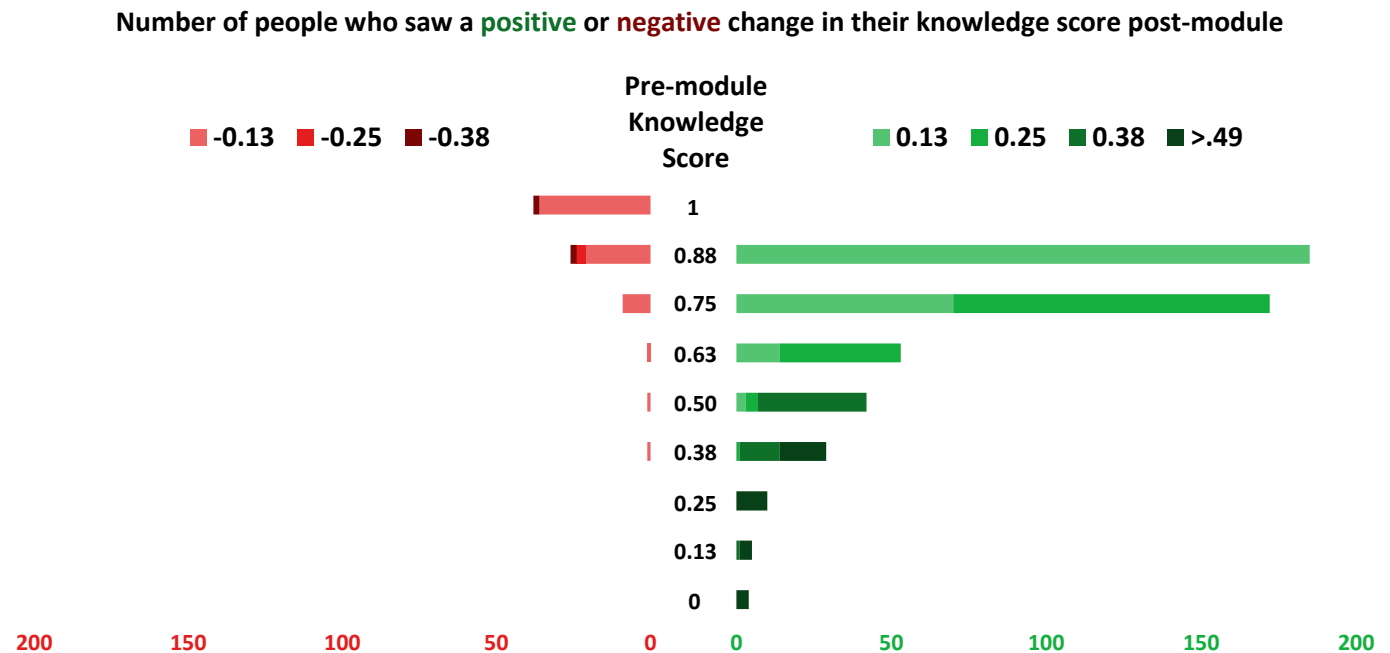
The majority of the Module 2 in-person trainings lasted one hour ( $n = 27$ , 64.29%), but one third of the trainings ( $n = 14$ , 33.33%) were over an hour long. Only one training (2.38%) was less than an hour, and it was completed in 20 minutes. On average, the Module 2 in-person training was completed in 70.07 minutes ( $n = 42$ ,  $SD = 21.57$ ).

### Outcomes

A total of 1005 trainees completed the pre- and post-module questionnaire for the Module 2 in-person training. On average, knowledge scores were higher for the post-module questionnaire. Results from the

dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .83$ ,  $SD = .16$ ) and post-module knowledge scores ( $M = .93$ ,  $SD = .10$ );  $t(1004) = -19.52$ ,  $p < .001$ . For this module, 889 (88.46%) trainees passed the post-module questionnaire on their first attempt. Of the 710 trainees who did not get a perfect score on the pre-module questionnaire, 500 (70.42%) improved their score on the post-module questionnaire. Figure 9 presents changes in knowledge scores from the pre-module questionnaires to the post-module questionnaires. The majority of trainees improved their scores, but 28 trainees who achieved a passing pre-module score did not pass their first post-module questionnaire attempt.

**Figure 9. Module 2 in-person training knowledge score changes**



\*384 trainees had no change in their post-module knowledge scores. Of these, 6 trainees had a pre-module knowledge score of less than 0.80.

Following module completion, trainees showed higher levels of agreement with attitudes that aligned with the module content compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 3.47$ ,  $SD = .70$ ) and the post-module questionnaire ( $M = 3.83$ ,  $SD = .58$ );  $t(950) = -18.12$ ,  $p < .001$ .

Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 3.94$ ,  $SD = .80$ ) and the post-module questionnaire ( $M = 4.24$ ,  $SD = .77$ );  $t(813) = -13.39$ ,  $p < .001$ .

## Module 3: Using the PDMP to Optimize Pain Management

### Online

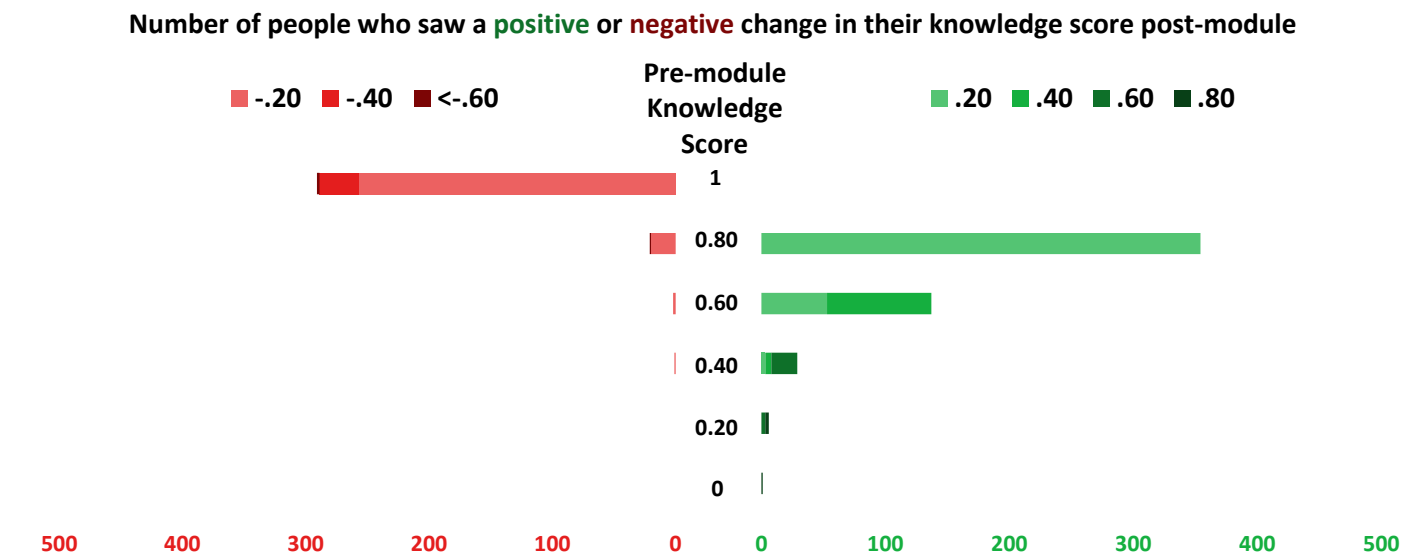
#### Time spent on training

Almost half ( $n = 1017$ , 44.29%) of the trainees spent 30 to 60 minutes on the Module 3 online training. About one third ( $n = 740$ , 32.22%) of the trainees spent more than one hour completing the training. Roughly one fifth ( $n = 539$ , 23.48%) took 15 minutes or less to complete the training, and 20.91% took more than 150 minutes. Only 12.11% ( $n = 278$ ) spent 15 to 30 minutes completing the training. On average, trainees spent 40.10 minutes ( $n = 1816$ ,  $SD = 26.78$ ) on the Module 3 online training.

## Outcomes

A total of 2193 trainees completed the pre- and post-module questionnaire for the Module 3 online training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .91$ ,  $SD = .14$ ) and post-module knowledge scores ( $M = .94$ ,  $SD = .11$ );  $t(2191) = -8.43$ ,  $p < .001$ . At first attempt, 2122 (96.76%) trainees passed the post-module questionnaire. Of the 741 trainees who did not get a perfect score on the pre-module questionnaire, 527 (71.12%) improved their score on the post-module questionnaire. Only 55 trainees who achieved a passing pre-module questionnaire score received a post-module questionnaire score below .80 as illustrated in Figure 10.

**Figure 10. Module 3 online training knowledge score changes**



\*1350 trainees had no change in their post-module knowledge scores. Of these, 10 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked to rate the extent to which they agreed that (1) the PDMP can provide important information that can assist in the development of a pain management plan, (2) doing a risk/benefit analysis when determining the best course of treatment for a patient with chronic pain is the provider's responsibility, and (3) they are confident in their ability to develop a non-opioid-based pain management plan. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 4.64$ ,  $SD = .54$ ) and the post-module questionnaire ( $M = 4.88$ ,  $SD = .38$ );  $t(2191) = -23.92$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) use the PDMP to search patients' prescription history when developing pain management plans, (2) discuss signs of risk identified in the PDMP with the patient, and (3) develop pain management plans for patients that do not include opioids when possible. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.52$ ,  $SD = .02$ ) and the post-module questionnaire ( $M = 4.85$ ,  $SD = .48$ );  $t(2191) = -22.41$ ,  $p < .001$ .

## In-Person

### Time spent on training

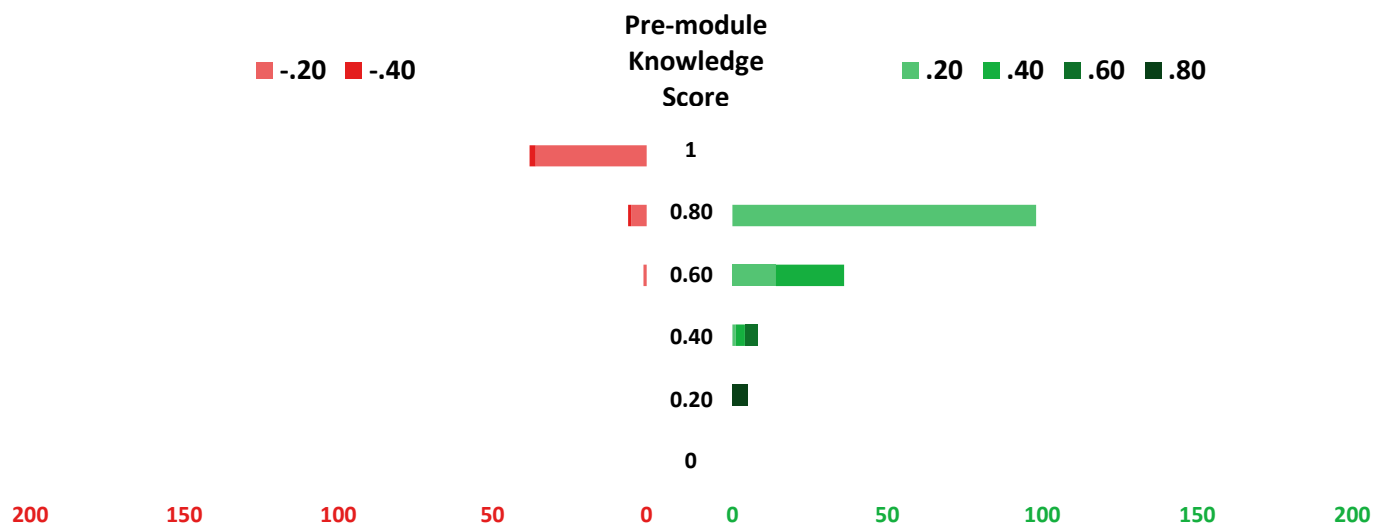
Almost half of the Module 3 in-person trainings ( $n = 17$ , 48.57%) were over one hour long. Sixteen (45.71%) trainings were completed in one hour while two were completed in less than one an hour (i.e., completed in 30 and 45 minutes). On average, the Module 3 in-person training was completed in 72.37 minutes ( $n = 35$ ,  $SD = 23.85$ ).

### Outcomes

A total of 789 trainees completed the pre- and post-module questionnaire for the Module 3 in-person training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .93$ ,  $SD = .14$ ) and post-module knowledge scores ( $M = .97$ ,  $SD = .08$ );  $t(788) = -7.79$ ,  $p < .001$ . At first attempt, 777 (98.48%) trainees passed the post-module questionnaire. Of the 197 trainees who did not get a perfect score on the pre-module questionnaire, 147 (74.62%) improved their score on the post-module questionnaire. Forty-three trainees who did not pass the pre-module questionnaire were successful in achieving a score of .80 or above on the post-module questionnaire. Only eight trainees passed their pre-module questionnaire, but failed their initial post-module questionnaire attempt. Results are presented in Figure 11 below.

**Figure 11. Module 3 in-person training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*597 trainees had no change in their post-module knowledge scores. Of these, 2 trainees had a pre-module knowledge score of less than 0.80.

Following module completion, trainees showed higher levels of agreement with attitudes that aligned with module content compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 4.33$ ,  $SD = .64$ ) and the post-module questionnaire ( $M = 4.53$ ,  $SD = .59$ );  $t(768) = -10.52$ ,  $p < .001$ .

Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.21$ ,  $SD = .78$ ) and the post-module questionnaire ( $M = 4.44$ ,  $SD = .76$ );  $t(647) = -10.67$ ,  $p < .001$ .



## Module 4: Opioid Prescribing Guide

### Online

#### Time spent on training

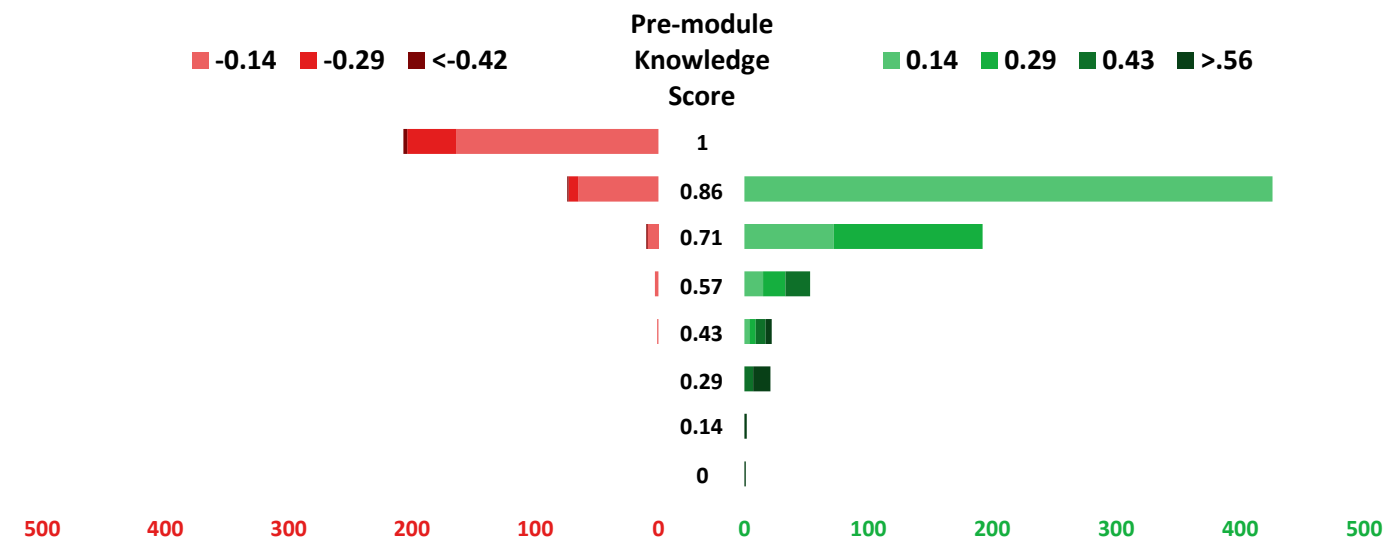
A majority of the trainees ( $n = 1141$ , 58.45%) completed the Module 4 online training in 15 minutes or less. One third ( $n = 649$ , 33.25%) of the trainees spent one to five minutes completing the training. About one fifth ( $n = 360$ , 18.44%) of trainees took over an hour to complete the training, while 13.17% ( $n = 257$ ) took 15 to 30 minutes. Only 9.94% ( $n = 194$ ) took 30 to 60 minutes to complete the training. On average, trainees spent 16.56 minutes ( $n = 1703$ ,  $SD = 23.96$ ) on the Module 4 online training.

#### Outcomes

A total of 1906 trainees completed the pre- and post-module questionnaire for the Module 4 online training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference on pre-module knowledge scores ( $M = .87$ ,  $SD = .14$ ) and post-module knowledge scores ( $M = .92$ ,  $SD = .11$ );  $t(1905) = -14.07$ ,  $p < .001$ . At first attempt, 1676 (87.93%) trainees passed the post-module questionnaire. Of the 1149 trainees who did not get a perfect score on the pre-module questionnaire, 717 (62.40%) improved their score on the post-module questionnaire. Figure 12 presents changes in knowledge scores from the pre-module questionnaires to post-module questionnaires. Over 250 trainees who did not pass the pre-module questionnaire were able to achieve a passing post-module questionnaire score; however, 117 trainees who passed the pre-module questionnaire did not pass the post-module questionnaire on their initial attempt.

**Figure 12. Module 4 online training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*894 trainees had no change in their post-module knowledge scores. Of these, 68 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked to rate the extent to which they agreed that (1) the PDMP is a useful tool that can be incorporated into patients' pain management and risk assessments when opioids are being used to manage a patient's pain, (2) prescribers should use non-opioid alternatives for pain management before prescribing opioids, and (3) opioid treatment should not be initiated without identifying and discussing treatment goals, benefits, and harms with the patient. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-

module questionnaire ( $M = 4.84$ ,  $SD = .46$ ) and the post-module questionnaire ( $M = 4.92$ ,  $SD = .35$ );  $t(1905) = -9.54$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) establish treatment goals with patients regarding pain and function before beginning opioid treatment, (2) periodically re-evaluate the risks/benefits of opioid use throughout the course of treatment, and (3) administer a urine drug test at least biannually to assess potential drug misuse or diversion. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.56$ ,  $SD = .68$ ) and the post-module questionnaire ( $M = 4.73$ ,  $SD = .01$ );  $t(1905) = -10.78$ ,  $p < .001$ .

## In-Person

### Time spent on training

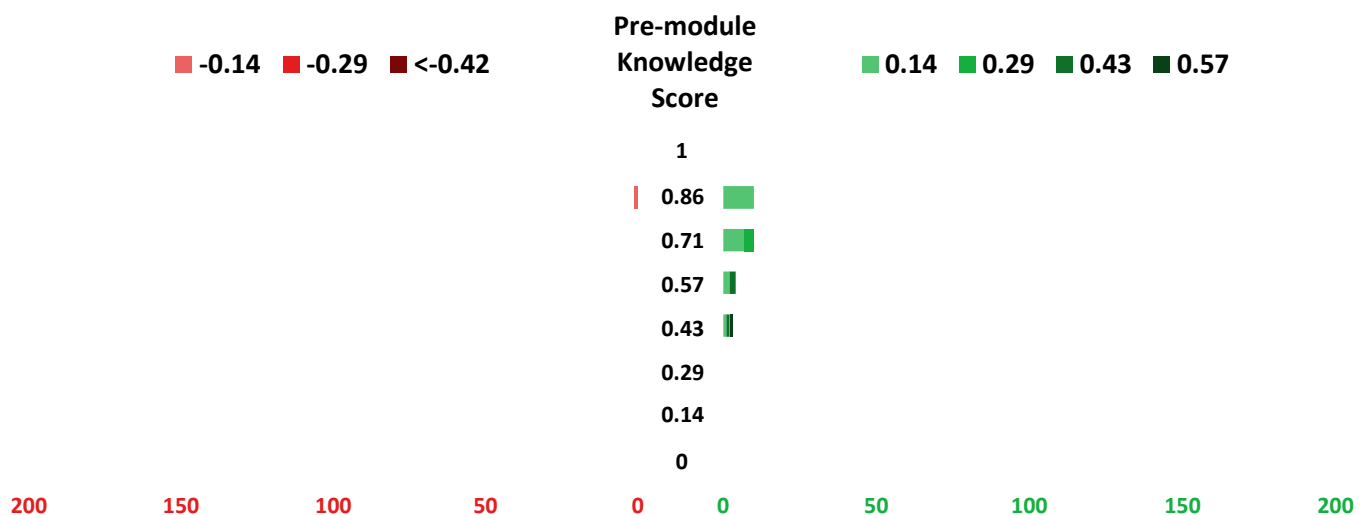
All seven (100%) of the Module 4 in-person trainings were completed in one hour.

### Outcomes

A total of 33 trainees completed the pre- and post-module questionnaire for the Module 4 in-person training. Note that this sample size does not provide adequate power to detect small to moderate effects of the intervention. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .74$ ,  $SD = .14$ ) and post-module knowledge scores ( $M = .90$ ,  $SD = .11$ );  $t(32) = -6.60$ ,  $p < .001$ . At first attempt, 29 (87.88%) trainees passed the post-module questionnaire. Of the four trainees who did not pass the post-module questionnaire, only one passed the pre-module questionnaire. No trainees got a perfect score on the pre-module questionnaire, but 27 (81.82%) improved their score on the post-module questionnaire. Results of pre-module questionnaire to post-module questionnaire knowledge score changes are presented in Figure 13.

**Figure 13. Module 4 in-person training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*5 trainees had no change in their post-module knowledge scores. Of these, no trainees had a pre-module knowledge score of less than 0.80.

Results from the dependent t-test comparing attitude scores indicated that there was not a significant difference in knowledge score between the pre-module questionnaire ( $M = 4.27$ ,  $SD = .79$ ) and the post-module questionnaire ( $M = 4.52$ ,  $SD = .54$ );  $t(32) = -1.77$ ,  $p = .09$ .

Results from the dependent t-test indicated there was not a significant difference in intention scores on the pre-module questionnaire ( $M = 4.18$ ,  $SD = .66$ ) and post-module questionnaire ( $M = 4.11$ ,  $SD = .80$ );  $t(32) = .69$ ,  $p = .50$ .

## Module 5: Referral to Treatment for Substance Use Disorder Related to Opioid Use Online

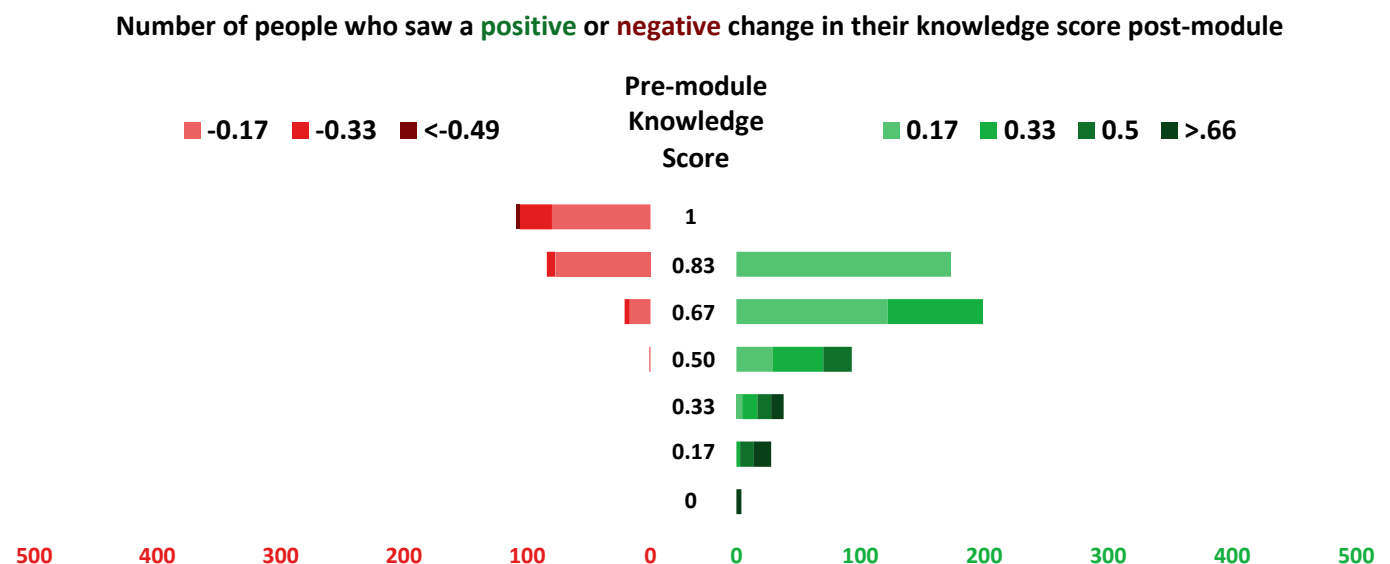
### Time spent on training

The majority of trainees ( $n = 687$ , 57.01%) completed the Module 5 online training in 15 minutes or less. More than a quarter ( $n = 331$ , 27.47%) of the trainees spent one to five minutes completing the training. About one fifth ( $n = 228$ , 18.92%) spent over an hour on the training, while 14.94% ( $n = 180$ ) took 15 to 30 minutes. Only 9.13% ( $n = 110$ ) spent 30 to 60 minutes on the training. On average, trainees spent 16.97 minutes ( $n = 1044$ ,  $SD = 24.31$ ) on the Module 5 online training.

### Outcomes

A total of 1161 trainees completed the pre- and post-module questionnaire for the Module 5 online training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .76$ ,  $SD = .20$ ) and post-module knowledge scores ( $M = .84$ ,  $SD = .15$ );  $t(1160) = -13.75$ ,  $p < .001$ . At first attempt, 867 (74.68%) passed the post-module questionnaire. Figure 14 illustrates changes from pre-module questionnaire to post-module questionnaire knowledge scores. Of the 907 trainees who did not get a perfect score on the pre-module questionnaire, 535 (58.99%) improved their score on the post-module questionnaire. Over 280 trainees who did not pass the pre-module questionnaire passed the post-module questionnaire. However, over 100 trainees passed the pre-module questionnaire, but did not pass the post-module questionnaire on their first attempt.

**Figure 14. Module 5 online training knowledge score changes**



\*411 trainees had no change in their post-module knowledge scores. Of these, 97 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked to rate the extent to which they agreed that (1) it is their responsibility to discuss and address OUD with their patients, (2) warm handoffs for OUD treatment can be integrated into their workflow, and (3) they are confident in their ability to use patient-centered communication to offer a warm handoff for OUD treatment. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 4.63$ ,  $SD = .68$ ) and the post-module questionnaire ( $M = 4.84$ ,  $SD = .45$ );  $t(1160) = -13.01$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) consult the PDMP to gain a comprehensive perspective on patients' opioid use, (2) consult resources to better understand the SUD treatment landscape in their county, and (3) work with colleagues to develop a warm handoff protocol. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.47$ ,  $SD = .86$ ) and the post-module questionnaire ( $M = 4.71$ ,  $SD = .67$ );  $t(1160) = -10.36$ ,  $p < .001$ .

## In-Person

### Time spent on training

All seven (100%) of the Module 5 in-person trainings were completed in one hour.

### Outcomes

A total of 99 trainees completed the pre- and post-module questionnaire for the Module 5 in-person training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .73$ ,  $SD = .21$ ) and post-module knowledge scores ( $M = .81$ ,  $SD = .18$ );  $t(98) = -4.33$ ,  $p < .001$ . At first attempt, 67 (67.68%) trainees passed the post-module questionnaire. Of the 81 trainees who did not get a perfect score on the pre-module questionnaire, 44 (54.32%) improved their score on the post-module questionnaire. Only six trainees who passed the pre-module questionnaire did not pass the post-module questionnaire. Results of pre-module questionnaire knowledge score changes are presented in Figure 15.

**Figure 15. Module 5 in-person training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*44 trainees had no change in their post-module knowledge scores. Of these, 14 trainees had a pre-module knowledge score of less than 0.80.

Results from the dependent t-test comparing attitude scores indicated that there was not a significant difference in the pre-module questionnaire ( $M = 4.15$ ,  $SD = .56$ ) and the post-module questionnaire ( $M = 4.22$ ,  $SD = .55$ );  $t(87) = -1.50$ ,  $p = .14$ .

Results from the dependent t-test indicated there was not a significant difference in intention scores on the pre-module questionnaire ( $M = 4.01$ ,  $SD = .65$ ) and post-module questionnaire ( $M = 3.95$ ,  $SD = .62$ );  $t(85) = 1.01$ ,  $p = .31$ .

## Module 6: Approaches to Addressing Substance Use Disorder with Patients Identified by the PDMP

### Online

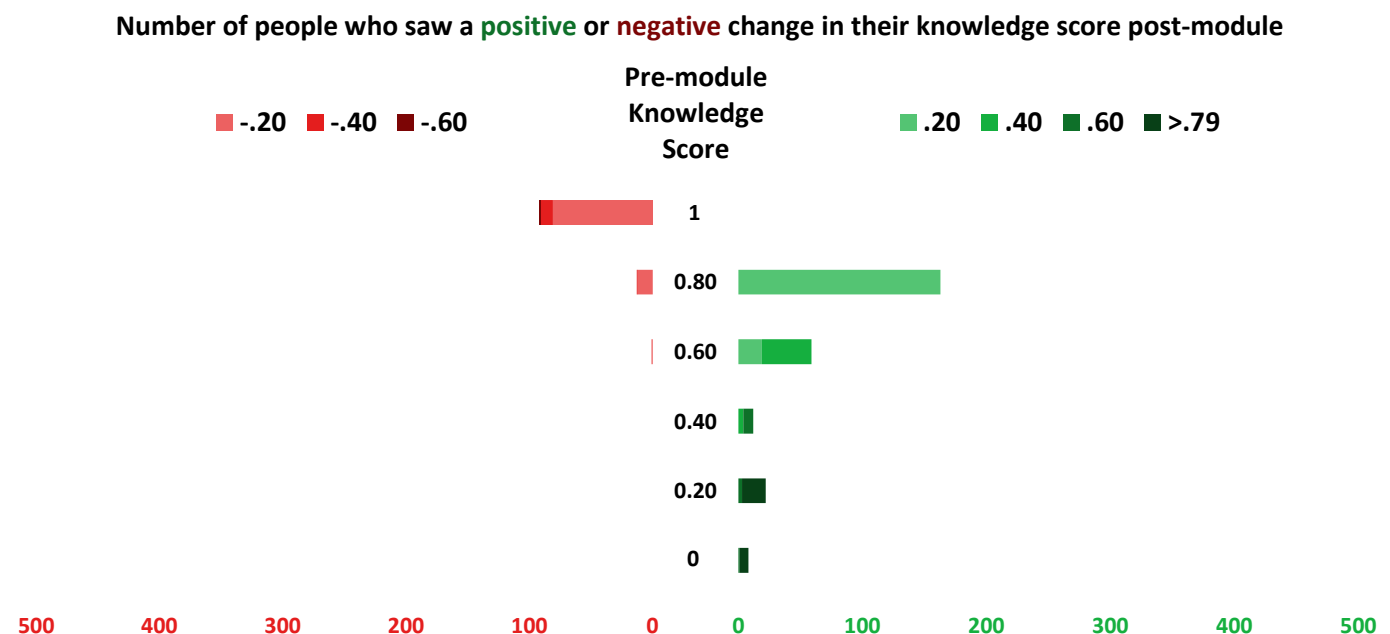
#### Time spent on training

Almost half of trainees ( $n = 568$ , 43.39%) spent 30 to 60 minutes completing the Module 6 online training. About one quarter ( $n = 357$ , 27.57%) took over an hour to complete the training, 15.52% ( $n = 201$ ) took 15 minutes or less, and 13.05% ( $n = 169$ ) took 15 to 30 minutes. On average, trainees spent 37.37 minutes ( $n = 1074$ ,  $SD = 25.98$ ) on the Module 6 online training.

#### Outcomes

There were 1241 trainees that completed the pre- and post-module questionnaire for the Module 6 online training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .91$ ,  $SD = .00$ ) and post-module knowledge scores ( $M = .96$ ,  $SD = .00$ );  $t(1240) = -9.33$ ,  $p < .001$ . At first attempt, 1121 (90.33%) passed the post-module questionnaire. Of the 345 trainees that did not get a perfect score on the pre-module questionnaire, 264 (76.52%) improved their score on the post-module questionnaire. As illustrated in Figure 16 below, 100 trainees who did not pass the pre-module questionnaire achieved a passing post-module questionnaire score. Twenty-four trainees who passed the pre-module questionnaire did not pass the post-module questionnaire.

**Figure 16. Module 6 online training knowledge score changes**



\*871 trainees had no change in their post-module knowledge scores. Of these, 4 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked to rate the extent to which they agreed that they know how to (1) use the PDMP to identify individuals who are at risk of an SUD, (2) interact with patient in a way that motivates them to commit to reducing their substance use, and (3) effectively identify patients who need specialty treatment for SUD. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 4.40$ ,  $SD = .82$ ) and the post-module questionnaire ( $M = 4.78$ ,  $SD = .47$ );  $t(1240) = -19.65$ ,  $p < .001$ .

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) talk to a patient about problematic OUD and (2) integrate the PDMP with other screening tools to help identify those who may require SUD treatment or increased monitoring. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.43$ ,  $SD = .86$ ) and the post-module questionnaire ( $M = 4.74$ ,  $SD = .61$ );  $t(1240) = -14.89$ ,  $p < .001$ .

## In-Person

### Time spent on training

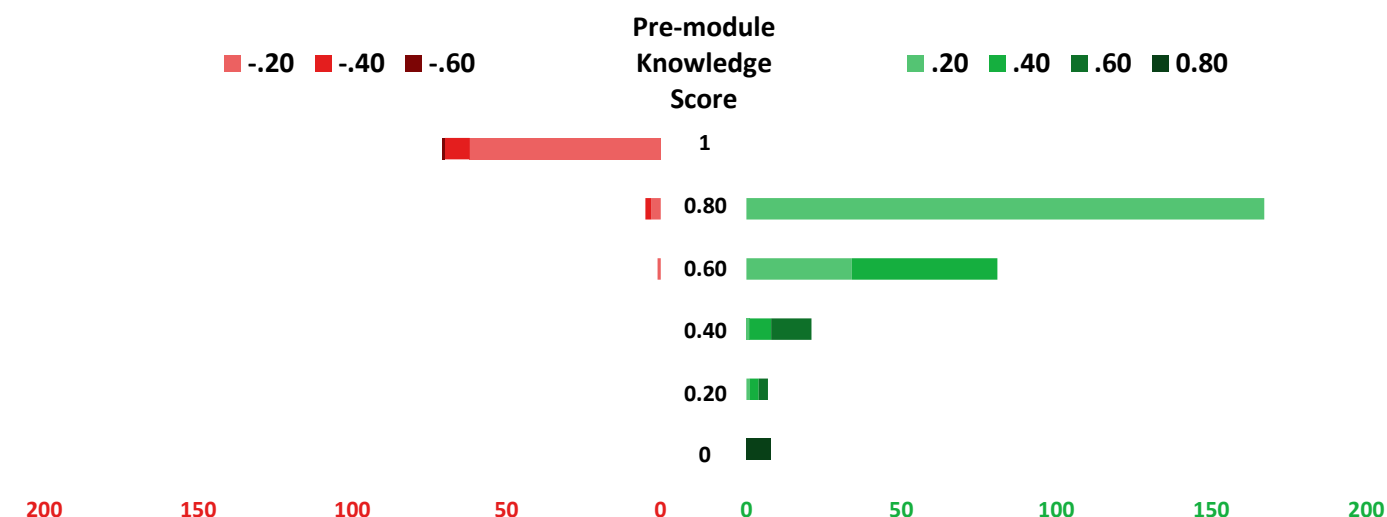
The majority ( $n = 28$ , 65.12%) of the Module 6 in-person trainings were completed in one hour. About one quarter ( $n = 12$ , 27.91%) of the trainings lasted over an hour. Four trainings (9.30%) lasted two hours or more, while two trainings (4.65%) lasted less than an hour (i.e., 45 minutes). On average, the Module 6 in-person training was completed in 70.48 minutes ( $n = 42$ ,  $SD = 24.14$ ).

### Outcomes

A total of 1134 trainees completed the pre- and post-module questionnaire for the Module 6 in-person training. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .90$ ,  $SD = .17$ ) and post-module knowledge scores ( $M = .96$ ,  $SD = .10$ );  $t(1133) = -11.36$ ,  $p < .001$ . At first attempt, 1104 (97.35%) trainees passed the post-module questionnaire. Of the 373 trainees that did not get a perfect score, 284 (76.14%) improved their score on the post-module questionnaire. Figure 17 presents changes in knowledge scores from pre-module questionnaires to post-module questionnaires. Results indicated that 112 trainees who did not pass the pre-module questionnaire did pass the post-module questionnaire, 31 of which at least doubled their pre-module questionnaire score. There were 14 trainees who received a passing pre-module questionnaire score, but did not pass their initial post-module questionnaire attempt.

**Figure 17. Module 6 in-person training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*773 trainees had no change in their post-module knowledge scores. Of these, 10 trainees had a pre-module knowledge score of less than 0.80.

Following module completion, trainees showed higher levels of agreement with attitudes that aligned with module content compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 3.38$ ,  $SD = .78$ ) and the post-module questionnaire ( $M = 4.31$ ,  $SD = .54$ );  $t(1067) = -25.42$ ,  $p < .001$ .

Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 3.91$ ,  $SD = .82$ ) and post-module questionnaire ( $M = 4.25$ ,  $SD = .73$ );  $t(1003) = -14.57$ ,  $p < .001$ .

## Module 7: Effective Opioid Tapering Practices

### Online

#### Time spent on training

About one third of the trainees ( $n = 387$ , 31.72%) took 15 to 30 minutes to complete the training. One quarter ( $n = 313$ , 25.66%) completed the training in 30 to 60 minutes, 22.54% ( $n = 275$ ) took over an hour to complete the training, and 20.08% ( $n = 245$ ) took 15 minutes or less. On average, trainees spent 31.68 minutes ( $n = 1050$ ,  $SD = 24.79$ ) on the Module 7 online training.

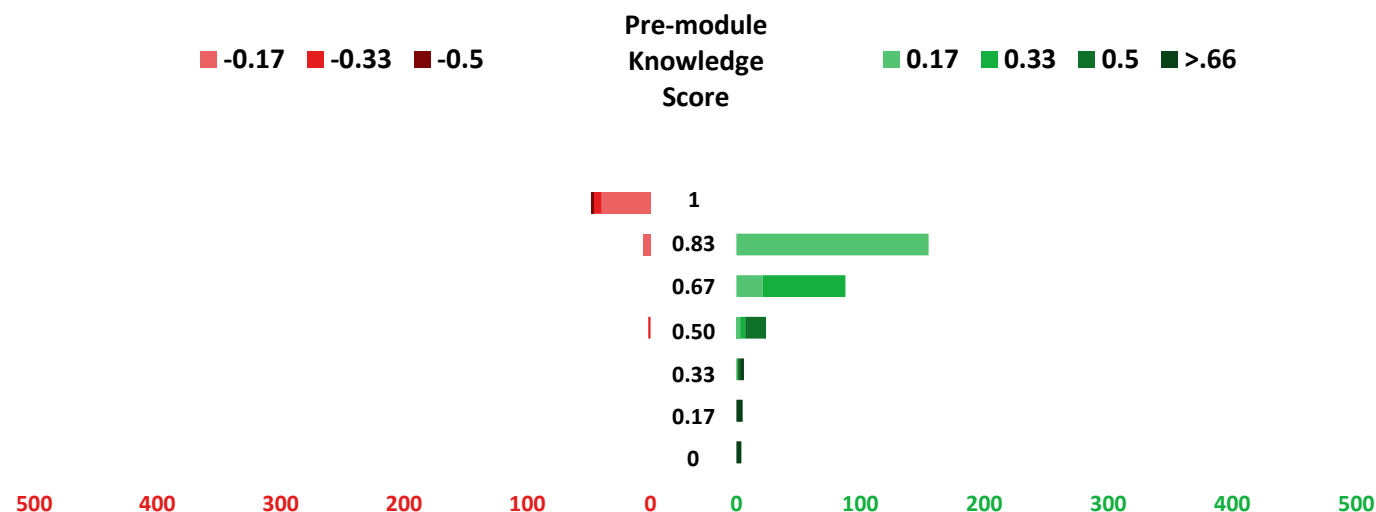
#### Outcomes

There were 1185 trainees who completed the pre- and post-module questionnaire for the Module 7 online trainings. On average, knowledge scores were higher for the post-module questionnaire. Results from the dependent t-test indicated a significant difference in pre-module knowledge scores ( $M = .92$ ,  $SD = .15$ ) and post-module knowledge scores ( $M = .98$ ,  $SD = .00$ );  $t(1184) = -12.26$ ,  $p < .001$ . At first attempt, 1159 (97.81%) trainees passed the post-module questionnaire. Of the 340 trainees that did not get a perfect score on the pre-module questionnaire, 282 (82.94%) improved their score on the post-module questionnaire. As illustrated in Figure 18 below, over 115 trainees who did not pass the pre-module questionnaire achieved a passing post-module questionnaire score. Fourteen trainees who passed the pre-module questionnaire did not pass the post-module questionnaire.



**Figure 18. Module 7 online training knowledge score changes**

Number of people who saw a **positive** or **negative** change in their knowledge score post-module



\*847 trainees had no change in their post-module knowledge scores. Of these, 6 trainees had a pre-module knowledge score of less than 0.80.

Trainees were asked to rate the extent to which they agreed that (1) the PDMP can help them decide when a patient could or should be tapered to a lower opioid dosage or discontinue opioid therapy, (2) they are comfortable in their ability to create a tapering plan for their patients, and (3) tapering is considered successful as long as the patient is making progress and reducing their original dose. Following module completion, trainees showed higher levels of agreement with these items compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated a significant difference in the pre-module questionnaire ( $M = 4.48$ ,  $SD = .02$ ) and the post-module questionnaire ( $M = 4.80$ ,  $SD = .47$ );  $t(1184) = -18.69$ ,  $p < .001$

Trainees were asked to rate their behavior (pre-module) or intention (post-module) to (1) use the PDMP to cross check which medications their patients have prescriptions for and what medications appear in their urine drug screening if they believe the patient is misusing opioids, (2) taper patients off or to a lower dose of opioids who are not benefitting from continued opioid therapy in pain or function, and (3) use patient-centered communication techniques when speaking with patients about tapering opioids. Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. Results from the dependent t-test indicated a significant difference in intention scores on the pre-module questionnaire ( $M = 4.72$ ,  $SD = .59$ ) and the post-module questionnaire ( $M = 4.82$ ,  $SD = .50$ );  $t(1184) = -6.19$ ,  $p < .001$ .

## In-Person

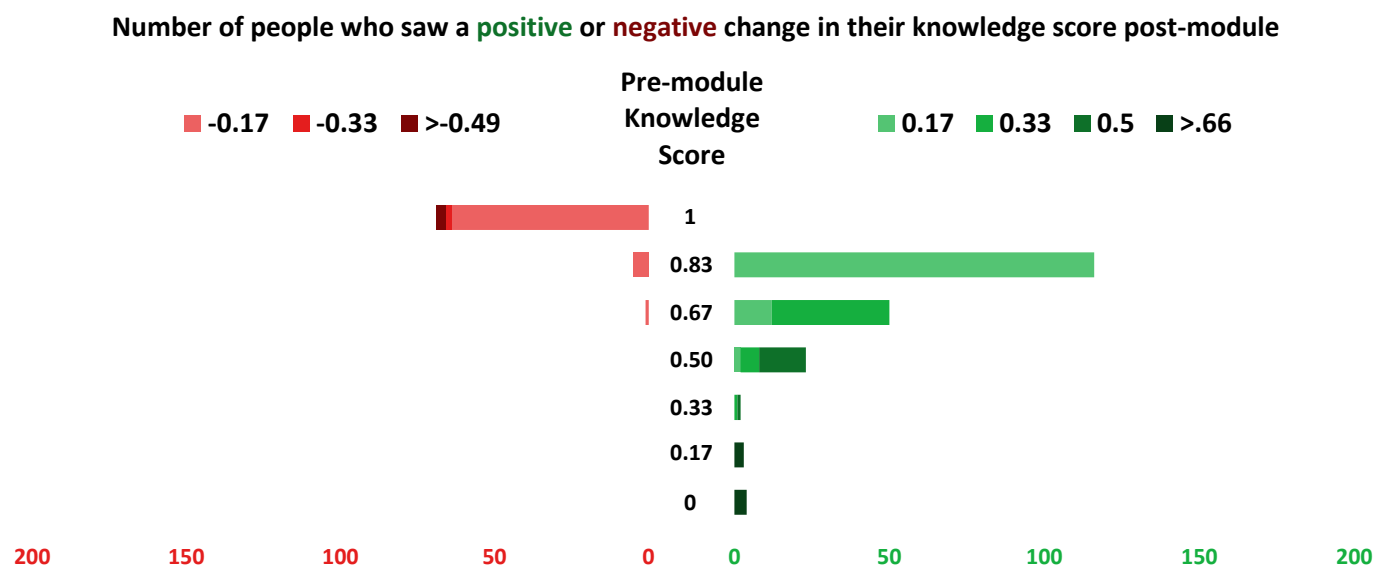
### Time spent on training

The majority ( $n = 27$ , 64.29%) of the Module 7 in-person trainings were completed in one hour. About one third ( $n = 14$ , 32.56%) of the trainings lasted over an hour, while 12 of these (27.91%) were 75 minutes or more. Only one training (2.38%) lasted less than one hour (i.e., 20 minutes). On average, the Module 7 in-person training was completed in 64.50 minutes ( $n = 30$ ,  $SD = 17.19$ ).

## Outcomes

A total of 1019 trainees completed the pre- and post-module questionnaire for the Module 7 in-person training. On average, knowledge scores were higher for the post-module questionnaire. There was a significant difference in pre-module knowledge scores ( $M = .93$ ,  $SD = .13$ ) and post-module knowledge scores ( $M = .97$ ,  $SD = .08$ );  $t(1018) = -8.33$ ,  $p < .001$ . At first attempt, 1001 (98.23%) trainees passed the post-module questionnaire. Of the 261 trainees that did not get a perfect score on the pre-module questionnaire, 198 (75.86%) improved their score on the post-module questionnaire. Figure 19 presents changes in knowledge scores from the pre-module questionnaires to the post-module questionnaires. Results indicated that over 70 trainees who did not pass the pre-module questionnaire did pass the post-module questionnaire. There were 10 trainees who received a passing pre-module questionnaire score, but did not pass their initial post-module questionnaire attempt.

**Figure 19. Module 7 in-person training knowledge score changes**



\*746 trainees had no change in their post-module knowledge scores. Of these, 5 trainees had a pre-module knowledge score of less than 0.80.

Following module completion, trainees showed higher levels of agreement with attitudes that aligned with module content compared to before module exposure. Results from the dependent t-test comparing attitude scores indicated that this difference was significant in the pre-module questionnaire ( $M = 3.93$ ,  $SD = .63$ ) and the post-module questionnaire ( $M = 4.34$ ,  $SD = .57$ );  $t(986) = -23.97$ ,  $p < .001$ .

Post-module intention scores reflected a greater level of agreement with behaviors encouraged in the module than pre-module intention scores. There was a significant difference in intention scores on the pre-module questionnaire ( $M = 4.30$ ,  $SD = .61$ ) and post-module questionnaire ( $M = 4.39$ ,  $SD = .66$ );  $t(852) = -4.55$ ,  $p < .001$ .

## Comparing change scores as a function of delivery mode

Modules 2, 3, 6, and 7 were delivered in both online and in-person modalities, allowing a preliminary examination of the differential effectiveness of modality type on the degree of change pre- and post-module for knowledge, attitude, and intention scores. For this examination, three pre-/post-module change scores (i.e., knowledge, attitude, intention) were calculated for each individual and a series of t-tests were used to compare change scores of each type for those who received in-person and online trainings. Change scores as a function of delivery mode are presented in Figure 20 for each module.

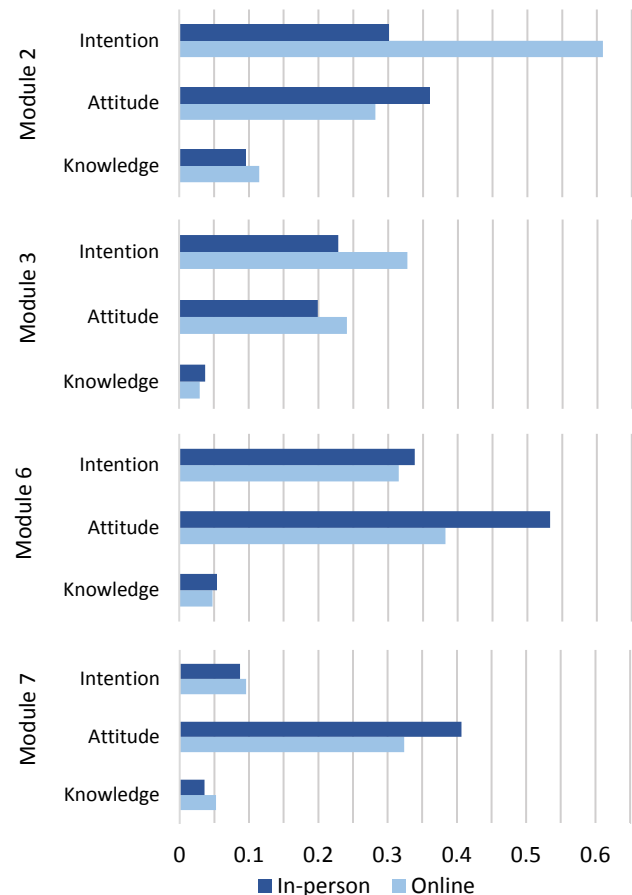
As can be seen in Figure 20, the online trainings were at least as or more effective than in-person trainings in increasing knowledge and intention scores for all four modules based on this change score analysis. Conversely, online trainings were less effective than in-person trainings in increasing attitude scores for modules 2, 6, and 7 but more effective in increasing attitude scores for module 3. Importantly, these analyses are exploratory in nature and do not account for the methodological differences between the two modalities (e.g., nesting of trainees for in-person trainings, completion time).

## Conclusions

For the majority of modules, both in-person and online trainings were effective in increasing knowledge and attitudes related to the module content. Overall, in-person trainings were generally an hour in duration across the various modules, and the variability in training duration was much lower for in-person trainings relative to online trainings.

Module 1's (Why Using the PDMP is Important for Achieving Optimal Health for Pennsylvania Citizens) online training did not have a positive impact on knowledge scores following the training. There are two possible explanations for this lack of positive effect, one or both of which may have contributed to this finding. First, this module presented information about the epidemiology of the opioid epidemic, presenting highly specific information (e.g., prevalence rates and other statistics) in the absence of more global messaging and interpretation of the implications of the statistics presented within the module. For this reason, Module 1's content may have been unlikely to change true knowledge levels. To the extent that trainees processed the materials presented, trainees may have been more likely to change their impressions about the causes of the opioid crisis and contributions of prescribers than they were to retain specific statistics. In fact, attitudes and behavioral intentions did improve following exposure to the module. Second, it is possible that if people spent more time reviewing and processing module materials, they may have scored higher on the post-module questionnaire. Future iterations of the training could include features designed to ensure that trainees are spending adequate time with the module(s).

**Figure 20. Comparing change scores as a function of delivery mode**



All other effects of the modules were in the expected direction. That is, both in-person and online Modules 2 (How to Use the PDMP to Make Clinical Decisions), 3 (Using the PDMP to Optimize Pain Management), 6 (Approaches to Addressing Substance Use Disorder with Patients Identified by the PDMP), and 7 (Effective Opioid Tapering Practices), and online Modules 4 (Opioid Prescribing Guide) and 5 (Referral to Treatment for Substance Use Disorder Related to Opioid Use) had positive impacts on trainees' knowledge, attitudes, and reported behavioral intentions. Modules 4 and 5 had only recently begun to be implemented in person, so the number of in-person trainees was relatively low. This resulted in insufficient power to detect small to moderate effect sizes. For this reason, we cannot draw conclusions about whether the module impacted attitudes or behaviors. However, these modules did result in statistically significant increase in knowledge as the magnitude of the effect was larger for this outcome.

A high proportion of trainees received a perfect score of 1 (i.e., 100% of items correct) on the pre-module questionnaire knowledge section for Modules 3, 6, and 7, which leaves (1) no possibility for these trainees to demonstrate knowledge gains as a result of the module content, and (2) few trainees in the overall sample to demonstrate knowledge gains following exposure to the module content. This may have limited our ability to evaluate the impact of these modules on knowledge scores. There are three possible explanations, some or all of which may contribute to this finding.

- (1) Because the questionnaire was built to align with the main components of the module, it is possible that the module content is too basic. That is, there was truly no additional knowledge to be gained from the module content for a substantial number of trainees because they already knew the information covered in the module.
- (2) Conversely, the knowledge items themselves may have focused on the more basic material covered in the training, and, as such, trainees may have gained knowledge that was unmeasured by the questionnaire.
- (3) Finally, it is possible that some of the knowledge items were written in a way that allowed trainees to easily identify incorrect options or to correctly guess the correct option, thereby not accurately measuring knowledge prior to or following the training.

Some of these factors may more closely explain this finding for one module whereas other factors may explain the finding for another module. Because trainees on the whole demonstrated improvement from pre- to post-module for both in-person and online trainings for all of these modules, at least some items in the questionnaires are accurately measuring knowledge gain.

## Recommendations

**CME process.** The PDMP Office should reevaluate the CME process used to incentivize participation in the initiative. For online trainings, trainees earned one CME credit for each module that they completed and achieved a knowledge score of 80% or greater. They could continue to retake the post-module questionnaire until they reached this threshold. As a result, many trainees could not have thoroughly reviewed the information presented in the module. In addition, this structure may not encourage online participants to complete the entire module series, which may slow reach of the education content. Half (0.5) of a CME is more accurate to the amount of time trainees invest in each module of online training.

**Long-term impact.** The Pa. DOH- and University of Pittsburgh-designed opioid education curriculum was effective in changing knowledge, attitudes, and behaviors/intentions related to module topics as measured by pre- and immediate post-module questionnaires. The current evaluation did not evaluate the sustained impact of the intervention over time on knowledge, attitude, and self-reported behavior (i.e., retention and integration of information presented in the modules over time). In addition, the

current evaluation did not examine objectively measured changes in the trainee's behavior related to PDMP use (e.g., changes in the frequency of PDMP searches, changes in prescribing behaviors). Importantly, these behaviors are captured in the PDMP system. We recommend building and prioritizing the further evaluation of the education modules to determine their long-term impact.

**Delivery mode.** There were no differences in the direction of the effects for the outcomes examined within each module across the two delivery modes for Modules 2 (How to Use the PDMP to Make Clinical Decisions), 3 (Using the PDMP to Optimize Pain Management), 6 (Approaches to Addressing Substance Use Disorder with Patients Identified by the PDMP), and 7 (Effective Opioid Tapering Practices), which were delivered both in-person and online to a large number of trainees. That is, both in-person delivery and online delivery positively impacted attitudes. Results from exploratory analyses demonstrated that, across all of the modules, the online training modality was at least as effective or more effective than the in-person modality in changing knowledge and intention scores from pre- to post-module; the reverse was true for the attitudinal scores of Modules 2, 3, and 6. It should be noted that some differences in impact between in-person and online delivery may be more subtle. For example, long-term retention of information and impact on skills and application of information, such as actual prescribing behavior or conversations with patients, were not measured by this evaluation. These are more likely to be impacted when the person is more systematically processing the information presented (Petty & Brinol, 2010<sup>9</sup>). It is likely that a substantial proportion of individuals who received the online training did not engage in systematic processing of the material given the short amount of time in which they completed the training. Pa. DOH should define education priorities for desired length of training, reach of the initiative, and short- and long-term impacts before making final decisions and allocating resources to provide future training using one type of modality over the other. This is particularly true in the absence of information about how each modality positively impacted objective provider behavior following the training session as captured by the PDMP. In addition to examining objective behaviors, further research could experimentally examine the impact of delivery mode (e.g., conducting a small study randomizing individuals to receive the training in either the in-person or online delivery) and conducting a cost-benefit analysis would allow the PDMP Office to make a more fully informed decision about optimal delivery mode for this initiative. The decision should also consider issues related to reach and accessibility of the different modalities.

**Module modification.** Findings from the evaluation suggest that the content and/or questionnaires for Modules 1 (Why Using the PDMP is Important for Achieving Optimal Health for Pennsylvania Citizens), 3, 6, and 7 may require modification. For example, Module 1 could be improved by providing supporting materials to help trainees process specific statistics and facts to impact general knowledge; a knowledge questionnaire could then focus on more general knowledge rather than recall of specific statistics. We recommend more in-depth evaluation of these modules through qualitative interviews and cognitive testing with a sample of providers. If Modules 3, 6, and 7 present more basic information related to each topic (based on high pre-module knowledge scores), additional modules could be designed to present more advanced and in-depth information on these topics. For example, facilitator/trainer notes for Module 7 indicated that trainees often requested more information about specific tapering protocols. A new module could be developed to provide more in-depth coaching sessions tailored with patient examples for providers who may need more specialized protocols in lieu of or as a supplement to general protocols.

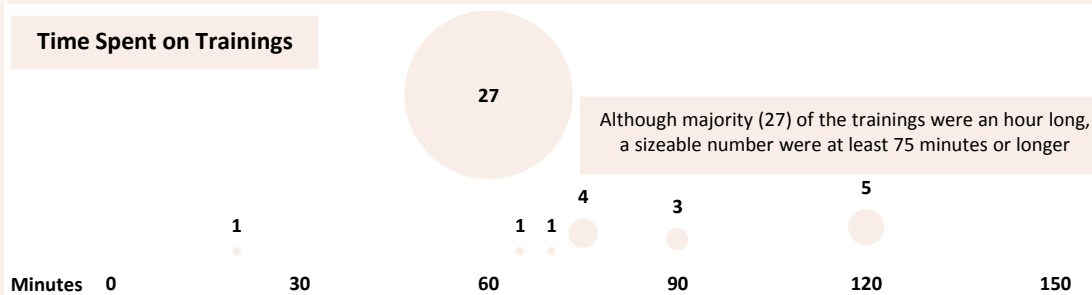
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<sup>9</sup> Petty, R. E., & Brinol, P. (2010). Attitude change. *Advanced social psychology: The state of the science*, 217-259.

## Appendix: In-person Modules

**Module 2: How to Use the PDMP to Make Clinical Decisions**Mode: **In-person****Module 2: Key Takeaways:**

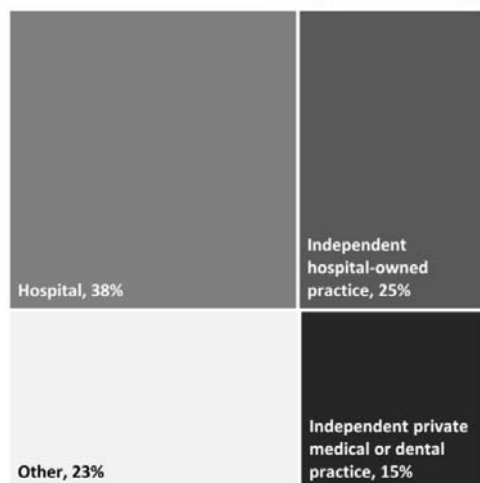
- The only module that had more participants from Philadelphia County (211) than Allegheny County (168).
- Exactly 500 participants answered more questions correctly from pre to post — the highest number among all modules.
- Participants' level of agreement with attitudes encouraged in the module was the lowest across all modules.

**Time Spent on Trainings**

Trainings

**57**Participants  
Attended**1128****Professional Role**

Others	Other prescriber	1
	Intern	7
	Delegate	1
	Admin Assistant	1
	Medical Assistant	20
Disp.	Other dispenser	0
	Pharmacist	9
	Nurse-midwife	2
Nurses	LPN	14
	RN	53
	NP	167
	Physician Assistant	79
Doctors	Medical Resident	63
	Dentist	5
	Physician	512

**Organization Type****Module Content Knowledge**

**88%**  
of participants passed the post-training quiz with a score of 80% or better.



**70%**  
of participants improved scores following the training.

**Behavior Change**  
Respondent Mean Scores (Min = 1, Max = 5)**Attitudes**

3.46

Beliefs about use of the PDMP in practice changed by + 0.36 points

3.82

**Intentions**

3.94

Intent to use PDMP changed by + 0.30 points

4.24

**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)

Trainer Knowledge

4.5

4.92

Content Clarity

4.42

4.92

Range of mean score by Trainer (min = 1, max = 5)



**Module 3: Using the PDMP to Optimize Pain Management**Mode: **In-person****Module 3: Key Takeaways:**

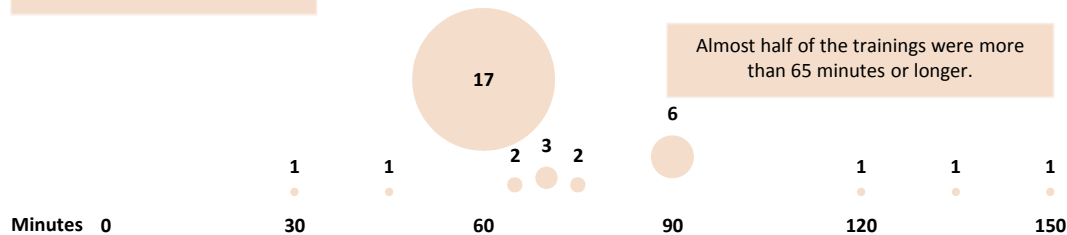
- People from 41 counties participated in this module — the lowest number among all modules with more than 10 trainings.
- The module had the lowest average number of participants per training (19) among all modules that were offered in-person since the start of the initiative.
- No other module had as many as nine trainings that lasted for 90 minutes or longer.

Trainings

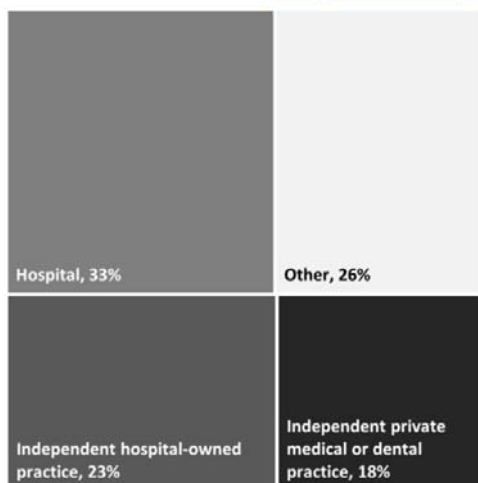
47

Participants  
Attended

872

**Time Spent on Trainings****Professional Role**

Others	Other prescriber	1
	Intern	0
	Delegate	2
	Admin Assistant	0
	Medical Assistant	4
Disp.	Other dispenser	0
	Pharmacist	5
	Nurse-midwife	5
Nurses	LPN	4
	RN	60
	NP	175
Doctors	Physician Assistant	64
	Medical Resident	2
	Dentist	6
	Physician	413

**Organization Type****Module Content Knowledge**

**98%**  
of participants passed the post-training quiz with a score of 80% or better.



**75%**  
of participants improved scores following the training.

**Behavior Change**  
Respondent Mean Scores (Min = 1, Max = 5)

4.33

**Attitudes**

Beliefs about the utility of the PDMP in pain management changed by + 0.20 points

4.53

4.21

**Intentions**

Intent to use PDMP to assist in pain management changed by + 0.23 points

4.44

**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)

Trainer Knowledge

4.23

4.92

Content Clarity

4.23

4.85

Range of mean score by Trainer (min = 1, max = 5)

## Module 4: Opioid Prescribing Guide

Mode: In-person



## Module 4: Key Takeaways:

- Only seven trainings have been conducted for this module.

## Time Spent on Trainings

7

All seven trainings were an hour long

Trainings

7

Participants  
Attended

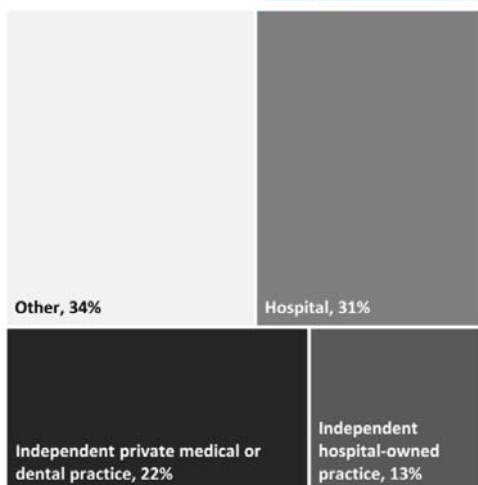
33

Minutes 0 30 60 90 120 150

## Professional Role

Others	Other prescriber	0
	Intern	0
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	0
Nurses	Nurse-midwife	0
	LPN	0
	RN	4
Doctors	NP	0
	Physician Assistant	0
	Medical Resident	4
	Dentist	0
	Physician	20

## Organization Type



## Module Content Knowledge

**88%**  
of participants passed the post-training quiz with a score of 80% or better.



**82%**  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

4.27

## Attitudes

Beliefs about the use of opioids in treatment plans changed by + 0.25 points

4.52

4.18

## Intentions

Intention to monitor patients who are receiving opioid treatment changed by -0.07 points

4.11

## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)

## Trainer Knowledge

## Content Clarity

4.1 4.44

Range of mean score by Trainer (min = 1, max = 5)

**Module 5: Referral to Tx for SUD Related to Opioid Use**Mode: **In-person****Module 5: Key Takeaways:**

- Only five trainings have been conducted for this module.

Trainings

5

Participants  
Attended

102

**Time Spent on Trainings**

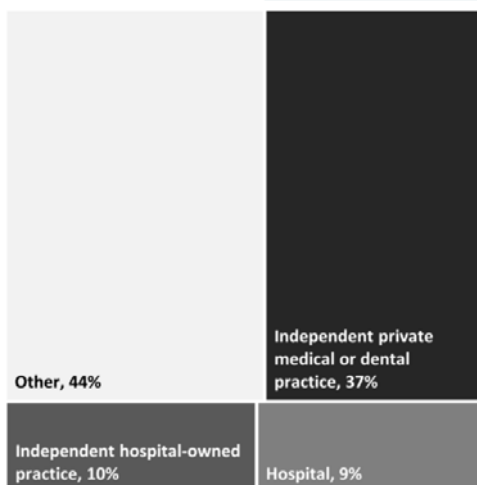
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All seven trainings were an hour long

Minutes 0 30 60 90 120 150

**Professional Role**

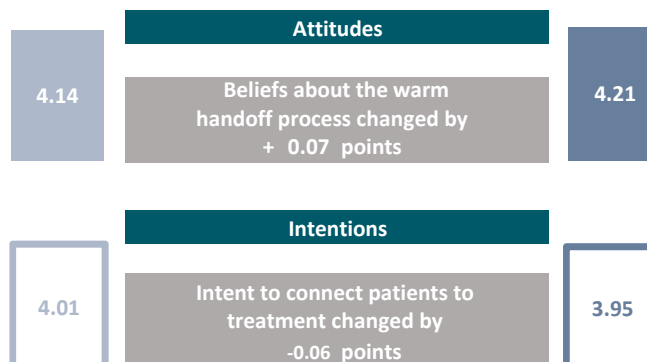
Others	Other prescriber	0
	Intern	0
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	0
Nurses	Nurse-midwife	0
	LPN	1
	RN	4
	NP	0
Doctors	Physician Assistant	0
	Medical Resident	1
	Dentist	0
	Physician	59

**Organization Type****Module Content Knowledge**

68%  
of participants passed the post-training quiz with a score of 80% or better.



54%  
of participants improved scores following the training.

**Behavior Change**  
Respondent Mean Scores (Min = 1, Max = 5)**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)



## Module 6: Addressing SUD with PDMP-identified Patients

Mode: In-person



## Module 6: Key Takeaways:

- This module had the highest total number of trainings as well as participants for any module.
- No other module had as many as five trainings that lasted for 120 minutes or longer.
- Favorable change in attitudes about practices encouraged by this module was the highest among all modules.

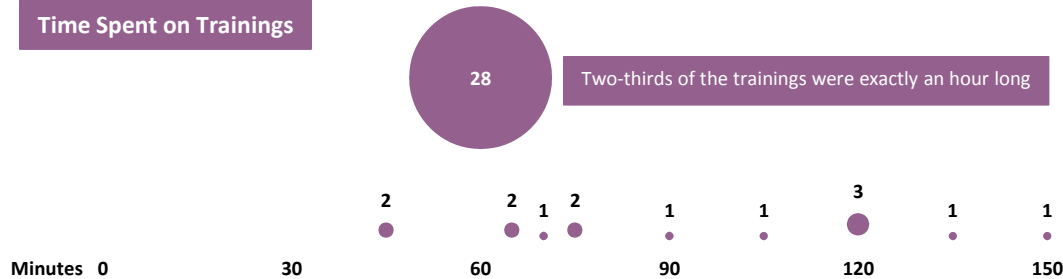
Trainings

55

Participants  
Attended

1240

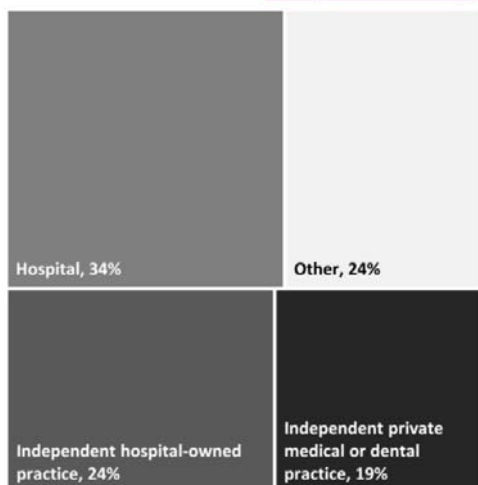
## Time Spent on Trainings



## Professional Role

Others	Other prescriber	1
	Intern	1
	Delegate	2
	Admin Assistant	1
	Medical Assistant	4
Disp.	Other dispenser	0
	Pharmacist	9
	Nurse-midwife	4
Nurses	LPN	7
	RN	96
	NP	173
Doctors	Physician Assistant	76
	Medical Resident	27
	Dentist	7
	Physician	649

## Organization Type

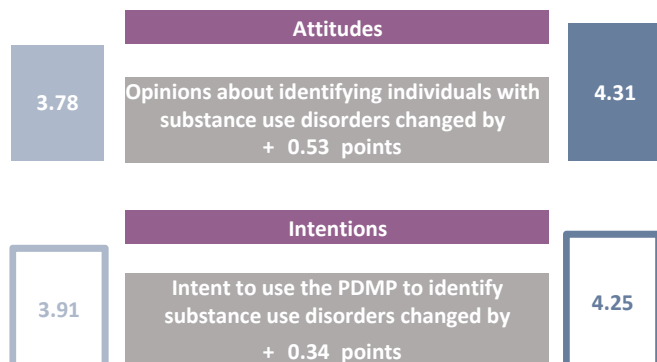


## Module Content Knowledge

97%  
of participants passed the post-training quiz with a score of 80% or better.



76%  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)



## Module 7: Effective Opioid Tapering Practices

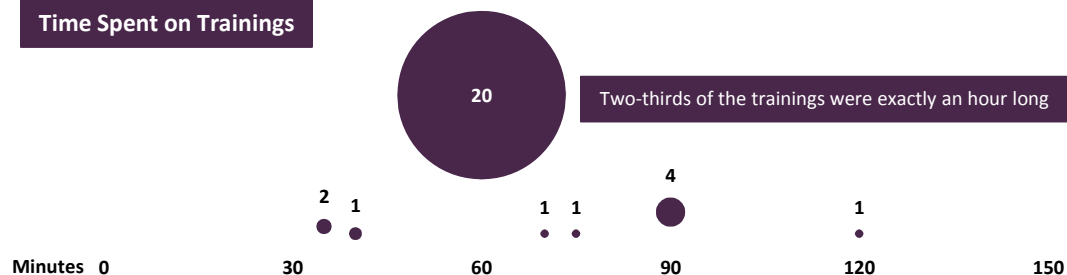
Mode: In-person



## Module 7: Key Takeaways:

- People from 50 counties completed this module — the highest among all modules.
- The module had the highest average number of participants per training (26) among all modules that were offered in-person since the start of the initiative.
- 98% of people passed the content knowledge quiz on their first attempt—the joint highest percentage with module 3.

## Time Spent on Trainings



Trainings

43

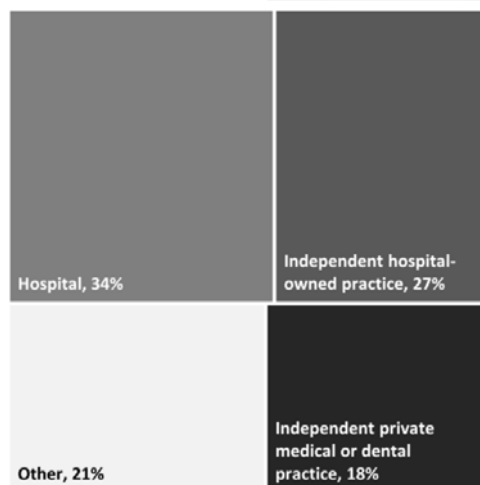
Participants  
Attended

1123

## Professional Role

Others	Other prescriber	0
	Intern	1
	Delegate	3
	Admin Assistant	0
Disp.	Medical Assistant	4
	Other dispenser	0
	Pharmacist	8
Nurses	Nurse-midwife	2
	LPN	3
	RN	57
	NP	180
Doctors	Physician Assistant	72
	Medical Resident	27
	Dentist	6
	Physician	606

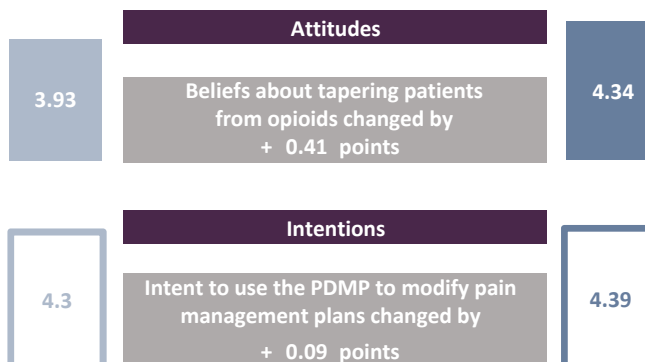
## Organization Type



## Module Content Knowledge

98%  
of participants passed the post-training quiz with a score of 80% or better.

76%  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

## Quality Improvement

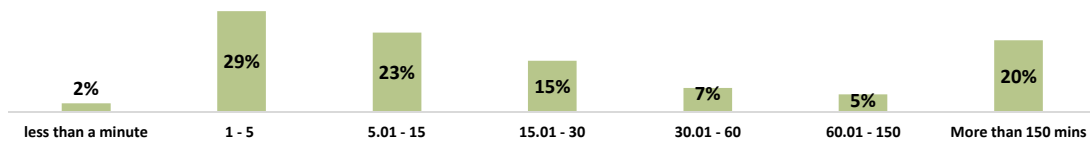
(Strongly Disagree = 1 - Strongly Agree = 5)



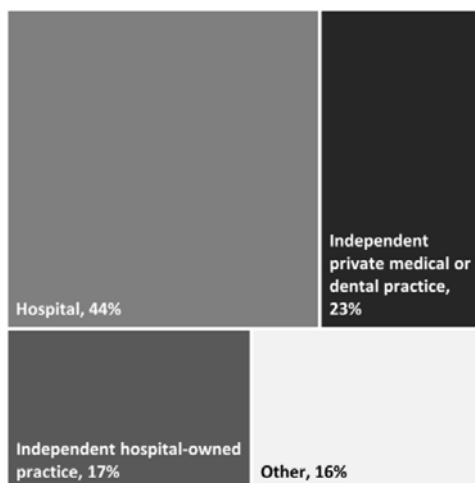
## Appendix: Online Modules

**Module 1: PDMP's Importance for Achieving Optimal Health**Mode: **Online****Module 1: Key Takeaways:**

- People from 61 counties participated in this module.
- 56% of participants identified as physicians —the highest proportion of physicians in any module.
- 61% of people passed the content knowledge at post —the lowest passing rate among all modules.
- Intent to use PDMP increased by 0.64 from pre- to post-training —the highest increase among all modules.

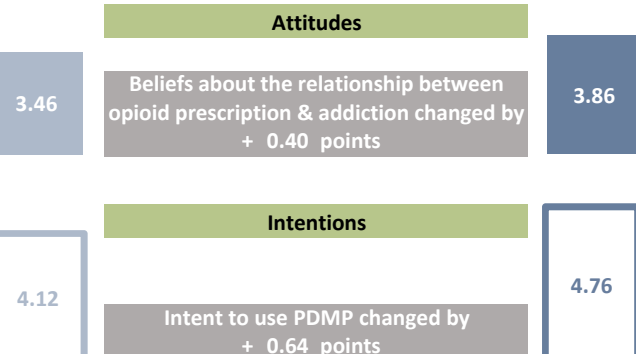
**Number of  
Pre-surveys  
completed**
**1876**
**Number of  
Post-surveys  
completed**
**1692****Time Spent on Training**
*Almost a third of participants spent less than 5 minutes on training.*
**Professional Role**

Others	Other prescriber	16
	Intern	1
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	5
	Nurse-midwife	10
Nurses	LPN	0
	RN	19
	NP	195
	Physician Assistant	309
Doctors	Medical Resident	30
	Dentist	150
	Physician	938

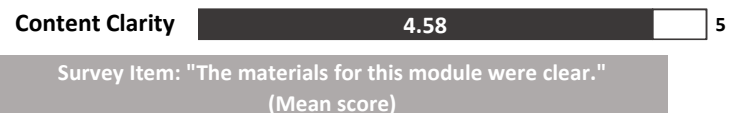
**Organization Type****Module Content Knowledge**

**61%**  
of participants passed the post-training quiz with a score of 80% or better.

**37%**  
of participants improved scores following the training.

**Behavior Change**  
 Respondent Mean Scores (Min = 1, Max = 5)
**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)



## Module 2: How to Use the PDMP to Make Clinical Decisions

Mode: Online



## Module 2: Key Takeaways:

- 57% of the counties had 10 or less participants —the highest among all modules.
- 43% of participants came from only two counties, Allegheny and Philadelphia —the highest concentration among all modules.
- Participants' level of agreement with attitudes encouraged in the module was the lowest across all modules.

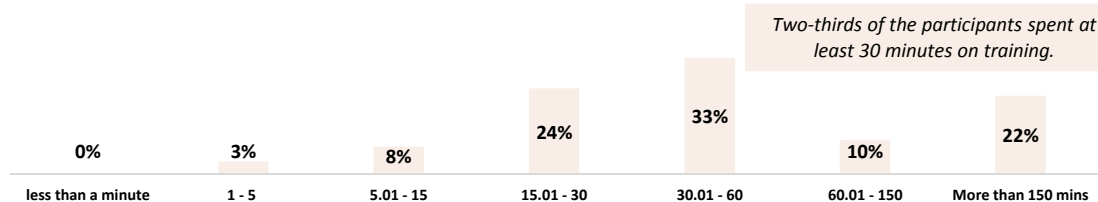
Number of  
Pre-surveys  
completed

1509

Number of  
Post-surveys  
completed

1387

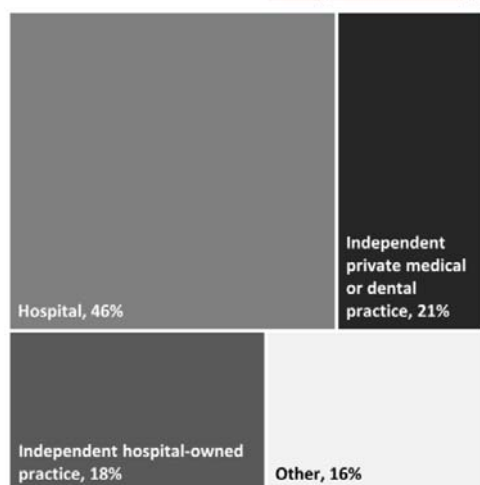
## Time Spent on Training



## Professional Role

Others	Other prescriber	11
	Intern	2
	Delegate	0
	Admin Assistant	1
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	2
	Nurse-midwife	6
Nurses	LPN	0
	RN	8
	NP	148
	Physician Assistant	256
Doctors	Medical Resident	22
	Dentist	128
	Physician	790

## Organization Type



## Module Content Knowledge

90%  
of participants passed the post-training quiz with a score of 80% or better.



79%  
of participants improved scores following the training.



Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

## Attitudes

3.48

Beliefs about use of the PDMP in practice changed by + 0.29 points

3.77

## Intentions

3.99

Intent to use PDMP changed by + 0.61 points

4.6

## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)

Content Clarity

4.78

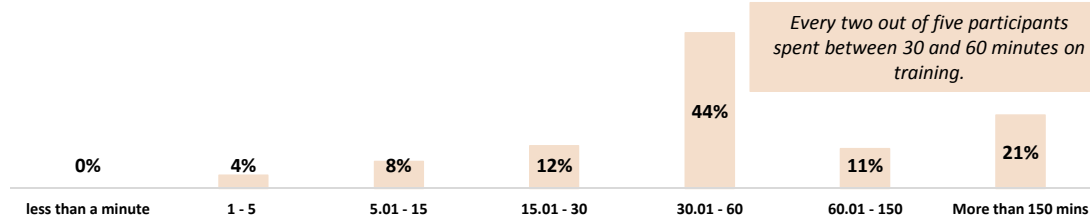
5

Survey Item: "The materials for this module were clear."  
(Mean score)

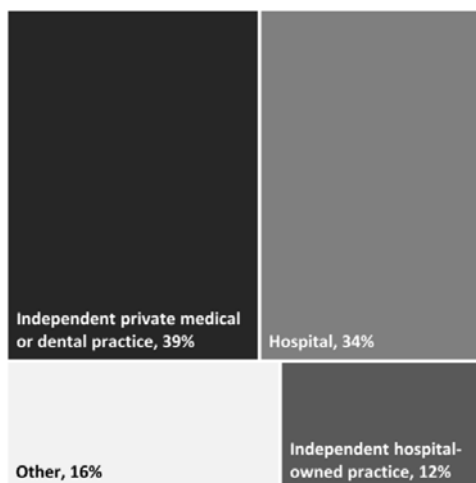


**Module 3: Using the PDMP to Optimize Pain Management**Mode: **Online****Module 3: Key Takeaways:**

- 2,193 people completed this module. This is almost 300 more than the next highest number of participants for any module.
- Over 650 participants came from only two counties, Allegheny and Philadelphia —the highest among all modules.
- 37% of participants for this module were dentists —the highest percentage among all modules.

**Number of  
Pre-surveys  
completed**
**2295**
**Number of  
Post-surveys  
completed**
**2193****Time Spent on Training****Professional Role**

Others	Other prescriber	25
	Intern	16
	Delegate	0
	Admin Assistant	1
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	1
	Nurse-midwife	9
Nurses	LPN	1
	RN	24
	NP	144
Doctors	Physician Assistant	294
	Medical Resident	73
	Dentist	838
	Physician	859

**Organization Type****Module Content Knowledge**

**97%**  
of participants passed the post-training quiz with a score of 80% or better.



**71%**  
of participants improved scores following the training.


**Behavior Change**  
 Respondent Mean Scores (Min = 1, Max = 5)

4.64

**Attitudes**

Beliefs about the utility of the PDMP in pain management changed by + 0.24 points

4.88

4.52

**Intentions**

Intent to use PDMP to assist in pain management changed by + 0.32 points

4.84

**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)

**Content Clarity****4.85****5**
 Survey Item: "The materials for this module were clear."  
(Mean score)

## Module 4: Opioid Prescribing Guide

Mode: Online



## Module 4: Key Takeaways:

- This is the only module where the number of dentists who completed the training was higher than the number of physicians.
- 33% of participants spent between 1-5 minutes browsing training materials —the highest percentage among all modules.
- Participants indicated the highest level of agreement with beliefs encouraged by this module, both pre- and post-training.

Number of  
Pre-surveys  
completed

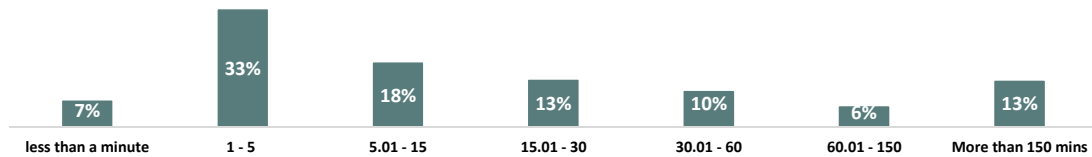
1952

Number of  
Post-surveys  
completed

1906

## Time Spent on Training

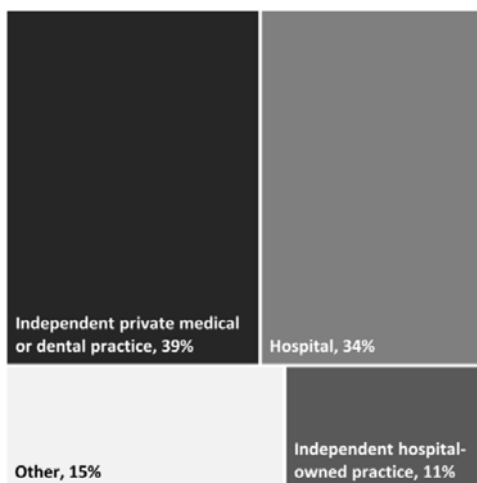
40% participants spent less than 5 minutes on training.



## Professional Role

Others	Other prescriber	23
	Intern	23
	Delegate	0
	Admin Assistant	2
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	2
	Nurse-midwife	12
Nurses	LPN	0
	RN	21
	NP	144
	Physician Assistant	279
Doctors	Medical Resident	76
	Dentist	773
	Physician	715

## Organization Type



## Module Content Knowledge

88%  
of participants passed the post-training quiz with a score of 80% or better.



62%  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

4.83

## Attitudes

Beliefs about the use of opioids  
in treatment plans changed by  
+ 0.08 points

4.91

4.56

## Intentions

Intention to monitor patients who are  
receiving opioid treatment changed by  
+ 0.17 points

4.73

## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)

## Content Clarity

4.83

5

Survey Item: "The materials for this module were clear."  
(Mean score)

## Module 5: Referral to Tx for SUD Related to Opioid Use

Mode: Online



## Module 5: Key Takeaways:

- Of the online modules, this one was completed least often.
- 8% of people spent less than a minute on reading training materials — the highest percentage among all modules.
- Only 59% of participants improved scores following the training — the lowest among all modules.

Number of  
Pre-surveys  
completed

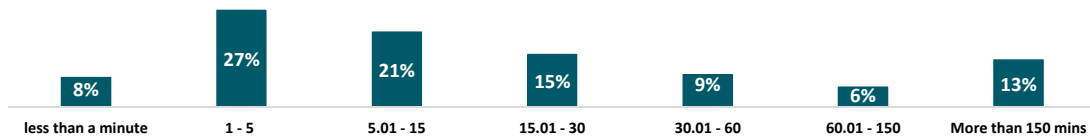
1205

Number of  
Post-surveys  
completed

1161

## Time Spent on Training

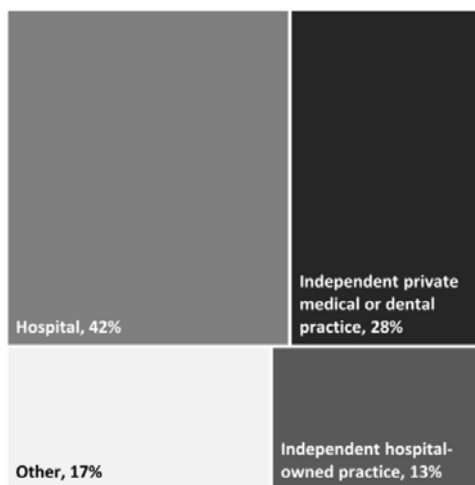
More than half of participants spent less than 15 minutes on training.



## Professional Role

Others	Other prescriber	8
	Intern	14
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	1
	Pharmacist	3
	Nurse-midwife	9
Nurses	LPN	0
	RN	19
	NP	116
	Physician Assistant	208
Doctors	Medical Resident	68
	Dentist	275
	Physician	516

## Organization Type



## Module Content Knowledge

75%  
of participants passed the post-training quiz with a score of 80% or better.



59%  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

4.63

## Attitudes

Beliefs about the warm  
handoff process changed by  
+ 0.21 points

4.84

4.47

## Intentions

Intent to connect people to  
treatment changed by  
+ 0.24 points

4.71

## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)

Content Clarity

4.79

5

Survey Item: "The materials for this module were clear."  
(Mean score)

## Module 6: Addressing SUD with PDMP-identified Patients

Mode: Online



## Module 6: Key Takeaways:

- People from 54 counties completed this module — the joint lowest with module 7.
- 44% of participants spent between 30 and 60 minutes on browsing training materials — the joint highest percentage with module 3.
- 98% of people passed the content knowledge quiz on their first attempt—the joint highest percentage with module 7.

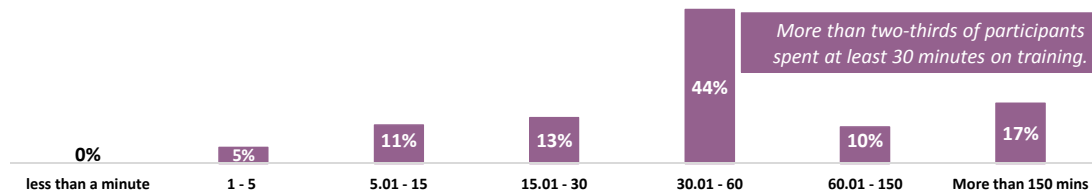
Number of  
Pre-surveys  
completed

1295

Number of  
Post-surveys  
completed

1241

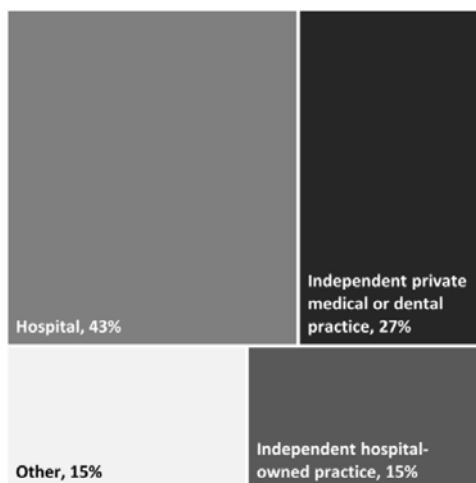
## Time Spent on Training



## Professional Role

Others	Other prescriber	5
	Intern	16
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	1
	Nurse-midwife	12
Nurses	LPN	0
	RN	14
	NP	115
	Physician Assistant	221
Doctors	Medical Resident	66
	Dentist	292
	Physician	545

## Organization Type

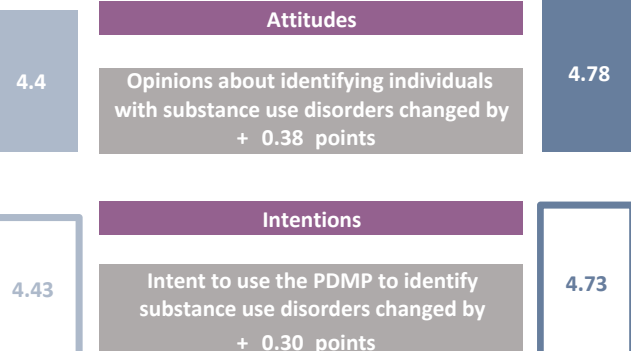


## Module Content Knowledge

98%  
of participants passed the post-training quiz with a score of 80% or better.

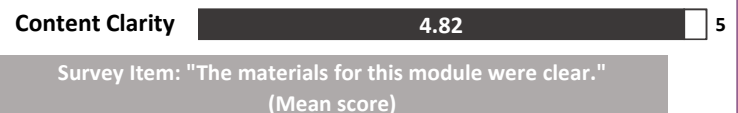


77%  
of participants improved scores following the training.

Behavior Change  
Respondent Mean Scores (Min = 1, Max = 5)

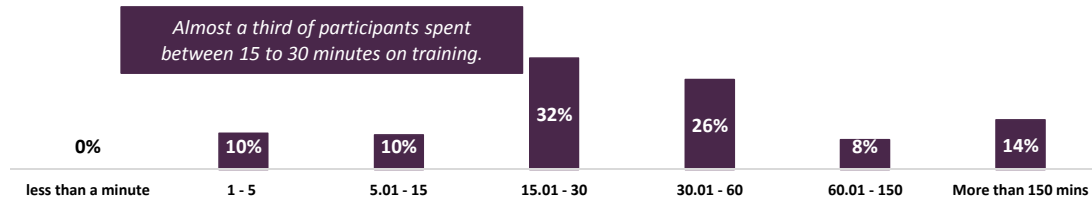
## Quality Improvement

(Strongly Disagree = 1 - Strongly Agree = 5)

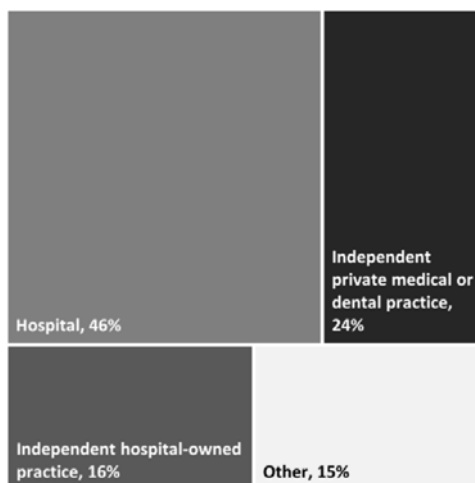


**Module 7: Effective Opioid Tapering Practices**Mode: **Online****Module 7: Key Takeaways:**

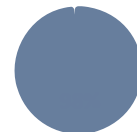
- People from 54 counties completed this module — the joint lowest with module 6.
- Almost a third of participants spent between 15 and 30 minutes on browsing training materials — the highest percentage among all modules.
- 83% of participants answered more questions correctly at post than at pre.

**Number of  
Pre-surveys  
completed**
**1220**
**Number of  
Post-surveys  
completed**
**1185****Time Spent on Training****Professional Role**

Others	Other prescriber	10
	Intern	15
	Delegate	0
	Admin Assistant	0
	Medical Assistant	0
Disp.	Other dispenser	0
	Pharmacist	2
	Nurse-midwife	13
Nurses	LPN	0
	RN	18
	NP	117
	Physician Assistant	216
Doctors	Medical Resident	69
	Dentist	207
	Physician	563

**Organization Type****Module Content Knowledge**

**98%**  
of participants passed the post-training quiz with a score of 80% or better.



**83%**  
of participants improved scores following the training.


**Behavior Change**  
 Respondent Mean Scores (Min = 1, Max = 5)

4.48

**Attitudes**

Beliefs about tapering patients from opioids changed by + 0.32 points

4.8

4.72

**Intentions**

Intent to use the PDMP to modify pain management plans changed by + 0.10 points

4.82

**Quality Improvement**

(Strongly Disagree = 1 - Strongly Agree = 5)

**Content Clarity**

4.83

5

 Survey Item: "The materials for this module were clear."  
(Mean score)